GLASS BEADS

The Levin Catalogue of Mid-19th Century Beads
A Sample Book of 19th Century Venetian Beads
Guide to the Description and Classification of Glass Beads

Karlis Karklins

Studies in Archaeology
Architecture and History

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Preface

This volume was published initially in 1982. Since then new information has been forthcoming regarding the Venetian Bead Book and several additions and changes have been made to the Guide. It is now evident that the Bead Book was used by a trader in India before its inclusion into the Felix Slade collection of Venetian glass some time before 1868. That the Bead Book originated in Venice is substantiated by its similarity in form and content to a bead sample book produced by the Venetian firm of Fratelli Giacomuzzi fu Angelo between 1852 and 1898. Regarding the "Guide to the Description and Classification of Glass Beads," several new bead types were added to the drawn category: Idd, Irr, IIhh and IIIr. In addition, types IIIq and IVq as defined in the first edition were changed to IIIpp and IVpp, respectively, and a new type IIIq was defined. In the wound category, the definition of type WIIk was expanded to include Beck bead shape I.B.1.e., while the Moulded Bead category (designated M) was renamed Prosser Moulded (designated PM) on the basis of evidence supplied by Roderick Sprague. Minor additions and changes were also made to several other sections, most notably those dealing with Historical Archaeological Interpretations.

I thank Peter Francis, Jr. of Lake Placid, N.Y., for bringing the Sloan catalogue to my attention, and Charles Arquette of Scottsdale, Arizona, for providing colour photographs of the Giacomuzzi material. Figures 1-4 in the Levin Catalogue report are reproduced by courtesy of the Trustees of the British Museum.

Preface to First Edition

The study of glass beads has intensified dramatically over the past two decades, with the primary concern of archaeologists, ethnographers and collectors seemingly being the determination of the temporal placement of their specimens. Although several useful chronologies have been produced for various ethnogeographical areas of North America, none of these is either temporally or typologically inclusive. Clearly, much more research must be conducted before truly comprehensive chronologies can be prepared.

Although specimens derived from tightly dated archaeological sites are primary data sources for determining the temporal ranges of bead types, accurately dated or datable bead dealers' and manufacturers' sample cards and catalogues are also useful for they indicate what was being manufactured and sold at a specific time and place. It was, therefore, very interesting to find that the Museum of Mankind (the Ethnography Department of the British Museum), 6 Burlington Gardens, London, England, possessed several important collections of beads including the so-called "Venetian Bead Book" and the "Levin Catalogue." As both contained a variegated assortment of beads that could be relatively tightly dated, they were recorded in detail during the fall of 1975 while I was in England conducting research on fur trade period artifacts for the National Historic Parks and Sites Branch, Parks Canada, Ottawa.

Gratitude is expressed to Kenneth J. Barton for making my stay in England a pleasurable and productive one. The staff of the Museum of Mankind, especially B.J. Mack, Assistant Keeper, are thanked for providing study space and general assistance.

The guide to the description and classification of glass beads that rounds out this volume was prepared for the use of the staff of the National Historic Parks and Sites Branch, Parks Canada, because none of the existing typologies was either comprehensive or elucidatory enough to permit untrained field and laboratory staff to adequately catalogue the various types of beads encountered on Canadian sites. Intended to fulfill a "how to" function, the guide not only characterizes all the bead manufacturing types and sub-categories encountered so far on North American sites, but also defines their attributes and explains how they are to be described. Interpretative material is presented for the benefit of those who may wish to take their analysis beyond the descriptive stage.

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THE LEVIN CATALOGUE OF MID-19TH CENTURY BEADS

Abstract

The Levin Catalogue is composed of two similar collections of glass and stone beads assembled by Moses Lewin Levin, a London bead merchant whose business operated from 1830 to 1913. A total of 621 beads of 128 different varieties makes up the collections which can be dated 1851-69. Although the beads are recorded as having been used in the African trade, several have counterparts in North American sites, thereby making the catalogue a potentially valuable research tool for those involved in the study of North American trade beads.

Introduction

The Levin Catalogue consists of two similar bead collections acquired by the Museum of Mankind in 1863 and 1960. The 1863 collection is composed of four small cardboard sheets to which are affixed a total of 124 short strands of beads. The statement "Presented by M.L. Levin, manufacturer, Bevis Marks, London" is handwritten in ink at the top of each sheet. A caption for each set of beads is similarly written at the bottom of each card (see figure legends for specifics).

The 1960 portion of the catalogue consists of three glass-topped display cases ca. 20x30 cm containing a total of 57 strands of beads, most of which are duplicated in the 1863 collection. Two of the cases are marked "Beads such as are used by Traders in West Africa, & given in exchange for Palm Oil & other African produce. Presented by M.L. Levin Esq., Manufacturer, Bevis Marks E.C." The remaining display case is marked "Beads such as have been used by Traders in West Africa as barter for Palm Oil and other African produce. Presented by M.L. Levin Esq., Manufacturer, Bevis Marks E.C." on the cover, while the former caption appears on the back of the case.

Although no information concerning the Levin Catalogue or M.L. Levin himself was on file at the museum, follow-up research at several libraries in London and Birmingham resulted in the compilation of a brief but comprehensive history of Mr. Levin and his bead business. This information was instrumental in dating the two collections that make up the catalogue.

M.L. Levin and Company

Moses Lewin Levin made his commercial debut in 1830 as an "importer of French fancy goods" at 12 Jewry Street, Aldgate, London (Robson's London Commercial Directory 1830). The following year Levin was the proprietor of a "Bead and Foreign toy-warehouse," and had been joined by Ephraim L. Levin, a "Dealer in Clock and Watch-tools, etc." (Critchett 1831: 240).

In 1838 the Levins moved to 16 Great Alie Street in Goodman's Fields, London, where they carried on business for the next ten years as "importers of fancy french jewellery, toys, beads, clocks, music boxes, and other foreign manufactures; also Birmingham and Sheffield goods of every description" (Kelly 1838: 348; 1840: 161; 1845: 828; 1847: 341). Then, in 1848, Ephraim Levin went on his own as an importer of fancy goods, beads and toys, leaving Moses Levin to carry on the existing import-export business alone (Kelly 1848: 920; 1849: 875). The following year, Moses Levin is described as having "a large supply of beads and cutlery in bond for the indian and african trade" (Kelly 1849: 875).

In 1851 M.L. Levin removed his prospering business to 1 Bevis Marks in east London (Kelly 1851: 850). Within three years, Levin had expanded his market to include America, in addition to India and Africa (Kelly 1854: 1009). By 1862 Levin had become a "manufacturer and importer of beads, coral, german cutlery, arms etc. for the african, american and indian markets" (Kelly 1862: 1072). However, as it was common practice at this time to designate oneself as a "manufacturer" regardless of whether one made anything or not, it is by no means certain that Levin actually produced any beads. In fact, considering the specialized facilities, the degree of skill and the number of workers required to produce glass beads on a commercial basis, it is probable that he did not.

Moses Levin's company continued as a "manufacturer" of beads until 1869, in addition to importing "coral, amber and glass beads, muskets and musket flints, mother-o'-pearl shell, cowries and african ivory" (Kelly 1866: 1192; 1869: 1034). Thereafter, Levin is listed only as an "importer." In 1876 the imports included "corals for the african and india trade, beads for trimmings etc." (Kelly 1876: 1108).

Moses L. Levin and Company remained at its 1 Bevis Marks address as importers of "beads, coral, agate, amber and glass for african and home trade; guns, arms and military stores of every description" until 1893 (Kelly 1885: 1072; 1893: 1136). The following year, the business was located at 101 Leadenhall Street, just a few blocks from the previous location (Kelly 1894: 1150). In 1898 Levin's company is listed as an importer of Venetian, Bohemian and German beads (Kelly 1898: 1230).

For the next 13 years the company was involved primarily in the importation of beads, amber, corals and cowrie shells, as well as the sale of old firearms (Kelly 1905: 1362; 1911: 1029). Then, in 1912, M.L. Levin's establishment moved to 9 Hills Place in central London, and once again became a "manufacturer" of bugles (short tubular beads) and beads

(Kelly 1912: 1045). However, this endeavour was short-lived. Two years after the move, Moses Lewin Levin and Company was no longer in business.

Inventory of Bead Varieties

The Levin Catalogue contains 186 drawn beads of 43 varieties, 784 wound beads of 76 varieties, 34 mould-pressed beads of 7 varieties and 17 carnelian beads of 2 varieties. The glass specimens are classified using an expanded version of the system developed by Kidd and Kidd (1970) as presented in Karklins (1982). Beads that do not appear in the Kidds' lists are marked by an asterisk (*) because they do not, as yet, have variety numbers. The type codes of these have sequential letters appended to them for easy reference.

Colours are designated using the names proposed in the *Color Harmony Manual* (Container Corporation of America 1958). The Color Harmony codes for these names and their equivalents in the Munsell colour notation system (Munsell Color 1976) are provided in Table 1.

The diaphaneity of the beads is described using the terms opaque, translucent and transparent. Simply defined, beads that are opaque are impenetrable to light except on the thinnest edges. Translucent specimens transmit light, yet diffuse it so that objects viewed through them are indistinct. Objects viewed through transparent beads are clearly visible.

Although the shape nomenclature is basically self-explanatory, a few brief comments may help clarify some of the terms used. All tubular beads have round cross-sections unless otherwise noted. Circular specimens are shaped like a torus (ring), that is, the shape of most embroidery (seed, pound and pony) beads. The round category includes beads that are not only spheroidal, but also oblate and barrel-shaped. Flat "disc" beads are oval or round specimens pressed flat parallel to the perforation while the glass was still viscid.

DRAWN BEADS

These are made from sections of glass tubing that was drawn out from a hollow globe of molten glass. The ends of the beads may be broken, or rounded as a result of subsequent heating and agitation.

Ia -- Tubular Monochrome Beads

Ia16 Tubular; opaque shadow blue; 1 specimen (Fig. 2, right column, row 2). Broken ends.
Length: 27.8 mm Diameter: 8.6 mm

Ia19 Tubular; transparent bright navy; 1 specimen (Fig. 2, left column, row 1). Broken ends.
Length: 32.4 mm Diameter: 10.2 mm

Table 1. Levin catalogue colour index.

Color Harmony Name	Color Harmony Code	Munsell	Equivalent
olive yellow	1 le	10.0Y	5/6
sunlight yellow	1-1/2 ga	5.0Y	8.5/8
light gold	2 ic	2.5Y	7/8
mustard gold	2 ne	2.5Y	6/8
mustard brown	2 pi	2.5Y	4/6
amber	3 ic	10.0YR	7/8
cinnamon	3 le	10.0YR	5/6
russet orange	4 nc	5.0YR	6/12
maple	4 ng	7.5YR	4/4
lead gray	5 ih	10.0YR	4/1
redwood	6 ne	10.0R	4/8
barn red	6 pg	10.0R	3/8
scarlet	7 pa	7.5R	4/14
dark rose brown	7 pn	2.5YR	2/2
rose wine	8 le	10.0RP	4/6
ruby	8 pc	2.5R	3/10
orchid mist	9 ec	2.5RP	7/4
bright Dutch blue	13 la	7.5PB	4/11
ultramarine	13 pa	6.25PB	3/12
bright navy	13 pg	7.5PB	2/7
copen blue	13-1/2 ic	5.0PB	5/7
medium blue	13-1/2 ng	5.0PB	3/6
shadow blue	14 ie	2.5PB	5/4
deep blue	14 pc	2.5PB	3/8
pale blue	15 ca	7.5B	8/2
cerulean blue	15 nc	7.5B	4/8
robin's egg blue	16 ic	5.0B	6/6
bright blue	16 lc	5.0B	5/7
medium turquoise blue	17 le	2.5B	5/5
turquoise	17 pa	10.0BG	4/8
aqua blue	18 gc	2.5B	6/4
bright turquoise	18 la	7.5BG	6/8
dark jade green	21 ng	10.0G	4/5
surf green	22 ie	5.0G	5/4
bright green	22 nc	2.5G	5/10
dark green	22 pi	2.5G	3/6
apple green	23 ic	10.0GY	6/6
dark palm green	23 ni	10.0GY	4/4
white	a	N	9/0
oyster white	b	N	8/0
light gray	c	N	7/0
black	p	N	1/0

Ia*(a) Tubular; translucent sunlight yellow; 1 specimen (Fig. 2, central column, row 1). Broken ends.
Length: 19.9 mm Diameter: 5.0 mm

Ia*(b) Tubular; transparent mustard brown; 1 specimen (Fig. 2, central column, row 4). Broken ends.
Length: 22.0 mm Diameter: 5.3 mm

Ia*(c) Tubular; translucent cinnamon; 4 specimens (Fig. 2; central column, rows 2 and 9). Broken and rounded ends.
Length: 14.6-17.6 mm Diameter: 6.2-7.2 mm

Ia*(d) Tubular; transparent copen blue; 8 specimens (Fig. 2, left column, row 2). The glass has a slight golden cast. The ends are well rounded.
Length: 3.5-5.5 mm Diameter: 3.6-4.2 mm

Ia*(e) Tubular; opaque dark palm green; 1 specimen (Fig. 2, right column, row 1). Flat ends.
Length: 23.5 mm Diameter: 8.8 mm

Ib -- Tubular Beads with Monochrome Bodies with Straight, Simple Stripes

Ib*(a) Tubular; opaque white body with 4 straight, transparent copen blue stripes set in a very thin layer of clear glass; 1 specimen (Fig. 2, central column, row 3). Broken ends.
Length: 23.7 mm Diameter: 4.3 mm

Ib' -- Tubular Beads with Monochrome Bodies with Spiral, Simple Stripes

Ib'*(a) Tubular; opaque black body decorated with 2 spiral, opaque medium turquoise blue and 2 spiral aventurine stripes that alternate around the bead; 1 specimen (Fig. 2, right column, row 4). Broken ends.
Length: 41.0 mm Diameter: 6.9 mm

Ibb' -- Tubular Beads with Monochrome Bodies with Spiral, Compound Stripes

Ibb'*(a) Tubular; transparent rose wine body decorated with 3 spiral, compound stripes of opaque lead gray on opaque redwood; 1 specimen (Fig. 2, central column, row 10). The body appears black unless held up to a strong light. The ends are broken.
Length: 47.1 mm Diameter: 6.6 mm

Ibb'*(b) Tubular; transparent rose wine body decorated with 3 spiral, compound stripes of opaque black on opaque white on opaque

redwood; 1 specimen (Fig. 2, central column, row 11). The body appears black unless held up to a strong light. The ends are broken.
Length: 40.6 mm Diameter: 7.0 mm

If -- Tubular Monochrome Beads with Surfaces Modified into Facets by Grinding

If*(a) Tubular, cornerless hexagonal; transparent bright navy; 5 specimens (Fig. 3, right column, row 6). This type consists of a short section of hexagonal tubing with a triangular facet cut on each corner. The body facets are composed of unaltered tube faces in the shape of elongated hexagons. There are 18 facets in all. The broken ends are relatively flat. These are the so-called "Russian beads."
Length: 6.6-7.9 mm Diameter: 6.6-7.5 mm

If*(b) Elongate, multi-faceted; translucent redwood; 1 specimen (Fig. 3, central column, row 2). The bead has a total of 50 cut facets; 30 diamond-shaped facets around the middle and 10 elongate pentagonal facets around either end. The latter have been cut flat.
Length: 49.4 mm Diameter: 9.1 mm

If*(c) Elongate, multi-faceted; transparent ruby; 6 specimens (Fig. 3, left column, row 2; Fig. 6, row 7). These beads are covered with 47-50 cut facets; 29-30 irregular diamond-shaped facets about the middle and 9-10 elongate pentagonal facets around either broken end.
Length: 37.2 mm Diameter: 15.7 mm

If*(d) Elongate, multi-faceted; transparent bright navy; 1 specimen (Fig. 3, left column, row 7). This type has the same form as the previous one. The ends are broken but flat.
Length: 27.3 mm Diameter: 13.8 mm

If*(e) Elongate, multi-faceted; opaque copen blue; 4 specimens (Fig. 6, row 5). This type has the same form as the previous one.
Length: 37.6-39.6 mm Diameter: 15.4-16.5 mm

If*(f) Teardrop, multi-faceted; transparent light gray; 3 specimens (Fig. 3, central column, row 8). The tapered end is hexagonal in cross-section and exhibits 6 elongate pentagonal facets oriented parallel to the axis of the perforation. The bulbous portion is covered with numerous, small pentagonal to diamond-shaped facets.
Length: 19.1-20.0 mm Diameter: 6.0-6.2 mm

Io -- Tubular Hexagonal Beads with Monochrome Bodies Exhibiting an "Alternating Twist"

This pattern was apparently produced by alternatingly twisting a heated hexagonal tube one way and then the other until a series of undulations had been formed in the body facets.

Io*(a) "Alternating twist" beads; transparent cinnamon; 1 specimen (Fig. 3, central column, row 4, left bead). The specimen displays four undulations. Its ends are tapered and jagged.
Length: 37.9 mm Diameter: 4.9 mm

Io*(b) "Alternating twist" beads; transparent maple; 1 specimen (Fig. 3, central column, row 4, right bead). This type has the same form as the previous one.
Length: 35.0 mm Diameter: 4.6 mm

Io*(c) "Alternating twist" beads; transparent rose wine; 2 specimens (Fig. 3, central column, row 6). This type has the same form as the previous one.
Length: 37.3-38.6 mm Diameter: 4.6-4.9 mm

Io*(d) "Alternating twist" beads; transparent ultramarine; 2 specimens (Fig. 3, central column, row 3). This type has the same form as the previous one.
Length: 36.3-40.0 mm Diameter: 5.8-6.1 mm

Io*(e) "Alternating twist" beads; transparent bright navy; 2 specimens (Fig. 3, central column, row 5). This type has the same form as the previous one.
Length: 32.3-36.6 mm Diameter: 4.7-4.9 mm

IIb -- Non-Tubular Beads with Monochrome Bodies with Straight, Simple Stripes

IIb*(a) Circular; transparent bright navy body decorated with 4 straight, opaque white stripes; 12 specimens (Fig. 2, left column, row 4).
Length: 2.0-3.2 mm Diameter: 4.1-4.4 mm

IIb*(b) Circular; medium size; transparent bright navy body decorated with 5 extremely narrow, straight, opaque white stripes; 10 specimens (Fig. 2, left column, row 8).
Length: 2.4-4.0 mm Diameter: 4.8-5.7 mm

IIIa -- Tubular Polychrome (Multi-Layered) Beads

IIIa5 Tubular; transparent scarlet outer layer; opaque white core; 6 specimens (Fig. 2, right column, rows 5 and 7). All specimens are slightly bent and have "orange peel" surfaces. The ends are well rounded. Two size populations are represented.
Length: 21.6-23.7 mm Diameter: 5.4-6.0 mm
20.7-23.8 mm 8.4-9.4 mm

IIIa*(a) Tubular; transparent bright navy outer layer; translucent copen blue middle layer; transparent bright navy core; 7 specimens

(Fig. 2, right column, row 9; Fig. 5, row 11). The surfaces are dull and pitted; the ends are cut flat.

Length: 26.6-27.6 mm Diameter: 10.6-11.1 mm

IIIb' -- Tubular Beads with Polychrome (Multi-Layered) Bodies with Spiral, Simple Stripes

IIIb'*(a) Tubular; opaque redwood outer layer decorated with 4 broad, spiral, opaque white stripes; opaque black core; 1 specimen (Fig. 2, right column, row 3). The ends are jagged.

Length: 45.7 mm Diameter: 7.9 mm

IIIbb' -- Tubular Beads with Polychrome (Multi-Layered) Bodies with Spiral, Compound Stripes

IIIbb'*(a) Tubular; opaque redwood outer layer decorated with 3 spiral, compound stripes of transparent rose wine on opaque white; transparent apple green core; 1 specimen (Fig. 2, central column, row 12). The ends are broken.

Length: 45.5 mm Diameter: 6.2 mm

IIIc -- Tubular Polychrome (Multi-Layered) Beads with Square Cross-Sections

IIIc*(a) Tubular (square cross-section); transparent medium blue outer layer and core; very thin, opaque white middle layer; 1 specimen (Fig. 3, central column, row 9). The ends have been cut flat, and the edges and corners of the ends have been ground down.

Length: 88.0 mm Diameter: 15.7 mm

IIIf -- Tubular Polychrome (Multi-Layered) Beads with Surfaces Modified into Facets by Grinding

IIIf*(a) Tubular, cornerless hexagonal; transparent ultramarine outer layer; translucent bright Dutch blue core; 5 specimens (Fig. 3, right column, row 4). This type consists of a short section of hexagonal tubing with a diamond-shaped facet cut on each corner. The body facets are formed by unaltered tube faces in the shape of elongated hexagons. Each specimen has a total of 18 facets. The broken ends are practically flat. This is another style of the so-called "Russian bead."

Length: 7.4-9.0 mm Diameter: 7.8-8.2 mm

IIIf*(b) Tubular, semi-cornerless hexagonal; transparent ultramarine outer layer and core; translucent bright Dutch blue middle layer; 3 specimens (Fig. 3, central column, row 7). This type consists of a hexagonal tube with a triangular facet cut on every other corner. The space between each of the former facets is occupied by a cut, elongate

diamond-shaped facet. Six elongate hexagonal facets formed by unaltered tube faces encircle the middle. Each specimen has a total of 18 facets. The ends are broken but flat.

Length: 21.3-21.4 mm Diameter: 4.5-4.7 mm

IIIf*(c) Tubular, semi-cornerless hexagonal; transparent bright navy outer layer and core; translucent bright Dutch blue middle layer; 1 specimen (Fig. 3, central column, row 1). This bead has the same form as the previous type.

Length: 57.5 mm Diameter: 7.1 mm

IIIf*(d) Elongate, multi-faceted; transparent bright navy outer layer; translucent bright Dutch blue core; 2 specimens (Fig. 3, left column, row 3). This type has a total of 50 cut facets: 30 irregular diamond-shaped facets encircling the middle and 10 elongate pentagonal facets around the ends. The latter are broken but flat.

Length: 32.3-32.7 mm Diameter: 12.4-12.9 mm

IIIf*(e) Elongate, multi-faceted; transparent ultramarine outer layer; transparent, light gray middle layer; thin, opaque white core; 2 specimens (Fig. 3, left column, rows 4 and 6). There are two sizes of this type. The smallest is covered with 55 cut facets: about 33 irregular diamond-shaped facets about the middle and 11 elongate pentagonal facets around the ends. The larger size has 65 corresponding facets (39 encircling the middle and 13 at either end). The end facets have been ground into the light gray layer, leaving the ultramarine glass as a medial band. The ends have been cut flat.

Length: 34.2 mm, 32.2 mm Diameter: 7.5 mm, 12.0 mm

IIIf*(f) Elongate, multi-faceted; transparent bright green outer layer; transparent light gray middle layer; thin, opaque white core; 1 specimen (Fig. 3, left column, row 5). This bead has the same configuration as the smaller variety of the previous type and the same comments apply.

Length: 36.0 mm Diameter: 8.0 mm

IIIk -- Tubular Multi-Layered "Chevron" Beads with Plain Outer Layers

IIIk*(a) Tubular (discoidal); "chevron" bead with 4 "starry" layers: (1) transparent bright navy outer layer; (2) opaque white layer; (3) opaque redwood layer; (4) opaque white core; 13 specimens (Fig. 2, left column, row 6). The ridges of the second layer show through as straight stripes. They are formed of extremely short tube sections with rounded ends.

Length: 1.8-4.0 mm Diameter: 6.3-7.3 mm

IIIk*(b) Tubular; "chevron" bead with 4 "starry" layers: (1) transparent turquoise outer layer; (2) opaque white layer; (3) opaque redwood layer; (4) opaque white core; 6 specimens (Fig. 2, right column, row 6).

The ridges of the second layer show through as straight stripes. All of the specimens have "orange peel" surfaces. Their ends are well rounded.
Length: 10.4-10.9 mm Diameter: 6.7-7.7 mm

IVa -- Non-Tubular Polychrome (Multi-Layered) Beads

IVa*(a) Circular; transparent scarlet outer layer; opaque white core; 10 specimens (Fig. 2, left column, row 11).
Length: 3.0-3.9 mm Diameter: 5.3-6.1 mm

IVb -- Non-Tubular Beads with Polychrome (Multi-Layered) Bodies with Straight, Simple Stripes

IVb*(a) Circular; opaque white outer layer decorated with 22 straight, alternating stripes of transparent scarlet and opaque bright navy; opaque shadow blue core; 8 specimens (Fig. 2, left column, row 12).
Length 4.6-5.8 mm Diameter: 5.6-6.2 mm

IVb*(b) Circular; opaque redwood outer layer decorated with 6 straight, opaque white stripes; transparent apple green core; 17 specimens (Fig. 2, left column, rows 7 and 10). Two size populations are represented.
Length: 2.9-4.1 mm Diameter: 4.5-4.8 mm
4.6-6.0 mm 6.2-6.7 mm

IVbb -- Non-Tubular Beads with Polychrome (Multi-Layered) Bodies with Straight, Compound Stripes

IVbb*(a) Circular; opaque white outer layer decorated with 6 straight, compound stripes composed of a transparent scarlet stripe adjacent to an opaque bright navy stripe; opaque shadow blue core; 7 specimens (Fig. 2, left column, row 9).
Length: 4.4-6.0 mm Diameter: 6.0-7.0 mm

IVbb*(b) Circular; opaque redwood outer layer decorated with 4 straight, compound stripes of transparent bright navy on opaque white transparent apple green core; 11 specimens (Fig. 2, left column, row 3).
Length: 2.4-3.3 mm Diameter: 3.6-3.9 mm

IVbb*(c) Circular; transparent medium turquoise blue outer layer decorated with 4 straight, compound stripes of opaque redwood on opaque white; translucent light gray core; 13 specimens (Fig. 2, left column, row 5).
Length: 2.1-2.8 mm Diameter: 3.6-4.0 mm

WOUND BEADS

The beads in this group were produced by repeatedly winding a filament of glass around a rotating mandrel until the desired size and shape were achieved.

WIa -- Cylindrical Monochrome Beads

WIa*(a) Cylindrical; opaque olive yellow; 11 specimens (Fig. 2, right column, row 8; Fig. 5, row 12). There are streaks in the glass.
Length 17.6-18.7 mm Diameter: 11.5-12.6 mm

WIa*(b) Cylindrical; translucent medium blue; 3 specimens (Fig. 2, central column, row 8). They have irregular outlines and dull surfaces.
Length: 12.7-14.5 mm Diameter: 8.2-8.3 mm

WIb -- Round Monochrome Beads

WIb1 Round; transparent light gray; 17 specimens (Fig. 1, central column, row 7; Fig. 7, row 12).
Length: 10.2-10.7 mm Diameter: 10.7-11.2 mm

WIb5 Round; translucent pale blue; 27 specimens (Fig. 1, right column, rows 5 and 13; Fig. 6, row 1; Fig. 7, row 28). The glass has a golden cast. Two size populations are represented.
Length: 8.1-10.0 mm Diameter: 10.2-10.5 mm
26.7-28.8 mm 29.3-31.0 mm

WIb7 Round; transparent amber; 19 specimens (Fig. 1, right column, row 2; Fig. 7, row 6). Their surfaces are shiny.
Length: 7.2-9.3 mm Diameter: 10.4-10.6 mm

WIb16 Round; transparent bright navy; 17 specimens (Fig. 1, central column, row 4; Fig. 7, row 8).
Length: 9.7-10.6 mm Diameter: 11.2-11.5 mm

WIb*(a) Round; clear (the glass has a slight greenish cast); 17 specimens (Fig. 1, central column, row 3; Fig. 7, row 22).
Length: 9.1-9.8 mm Diameter: 10.3-10.7 mm

WIb*(b) Round; translucent oyster white; 3 specimens (Fig. 1, right column, row 9).
Length: 11.0-12.4 mm Diameter: 13.6-14.1 mm

WIb*(c) Round; translucent light gray; 14 specimens (Fig. 7, row 19). The glass is crackled.
Length: 8.0-9.7 mm Diameter: 9.8-10.8 mm

Wlb*(d) Round; opaque black; 24 specimens (Fig. 1, central column, row 10; Fig. 5, row 3; Fig. 7, row 24). Their surfaces are shiny. There are two size groups.

Length: 9.1-10.7 mm Diameter: 11.3-12.0 mm
13.2-14.1 mm 15.6-16.9 mm

Wlb*(e) Round; translucent mustard gold; 4 specimens (Fig. 1, central column, row 6).

Length: 7.8-9.3 mm Diameter: 10.7-12.3 mm

Wlb*(f) Round; transparent barn red; 19 specimens (Fig. 1, central column, row 2; Fig. 7, row 16).

Length: 8.8-9.7 mm Diameter: 11.2-11.8 mm

Wlb*(g) Round; transparent scarlet; 3 specimens (Fig. 1, right column, row 4).

Length: 10.1-10.7 mm Diameter: 10.4-11.4 mm

Wlb*(h) Round; transparent rose wine; 15 specimens (Fig. 1, central column, row 8; Fig. 7, row 21).

Length: 10.2-12.4 mm Diameter: 12.4-13.5 mm

Wlb*(i) Round, opaque copen blue; 31 specimens (Fig. 1, right column, row 11; Fig. 5, row 13; Fig. 7, row 29). The glass is swirled and the surfaces are shiny. Two size populations are represented.

Length: 9.3-11.0 mm Diameter: 10.5-11.1 mm
15.7-16.4 mm 15.6-16.2 mm

Wlb*(j) Round; translucent cerulean blue; 21 specimens (Fig. 1, right column, row 1; Fig. 7, row 10).

Length: 7.4-8.8 mm Diameter: 9.2-9.7 mm

Wlb*(k) Round; transparent dark green; 19 specimens (Fig. 1, central column, row 5; Fig. 7, row 26).

Length: 7.6-10.9 mm Diameter: 10.2-11.0 mm

Wlb*(l) Round; translucent apple green; 24 specimens (Fig. 1, central column, row 9, and right column, row 3; Fig. 7, row 14). The glass is swirled and contains numerous bubbles. The surfaces are shiny. Two size populations are represented.

Length: 7.3-8.6 mm Diameter: 9.8-10.4 mm
9.9-12.7 mm 12.4-13.5 mm

Wlc -- Oval Monochrome Beads

Wlc1 Oval; opaque white; 4 specimens (Fig. 5, row 16).

Length: 28.4-29.5 mm Diameter: 16.1-17.0 mm

Wlc5 Oval; transparent amber; 13 specimens (Fig. 1, left column, row 11; Fig. 7, row 11).

Length: 13.2-17.6 mm Diameter: 6.1-7.0 mm

Wlc*(a) Oval; translucent oyster white; 15 specimens (Fig. 1, left column, rows 13 and 15; Fig. 7, row 9). Two size populations are represented.

Length: 13.2-14.9 mm Diameter: 7.9-8.8 mm
30.1-31.5 mm 19.8 mm

Wlc*(b) Oval; opaque black; 12 specimens (Fig. 1, left column, row 14; Fig. 7, row 7). They are shiny and represent two size populations.

Length: 13.0-16.1 mm Diameter: 7.6-8.8 mm
18.5-19.2 mm 10.3-11.5 mm

Wlc*(c) Oval; translucent mustard gold; 12 specimens (Fig. 1, left column, row 8; Fig. 7, row 27).

Length: 15.7-17.3 mm Diameter: 8.1-8.9 mm

Wlc*(d) Oval; transparent rose wine; 12 specimens (Fig. 1, left column, row 9; Fig. 7, row 1).

Length: 14.5-17.5 mm Diameter: 6.5-7.7 mm

Wlc*(e) Oval; opaque ultramarine; 5 specimens (Fig. 1, left column, row 5).

Length: 10.6-12.0 mm Diameter: 6.1-6.6 mm

Wlc*(f) Oval; translucent bright navy; 12 specimens (Fig. 1, left column, row 10; Fig. 7, row 3). Their surfaces are shiny.

Length: 14.8-16.2 mm Diameter: 6.6-8.0 mm

Wlc*(g) Oval; transparent bright navy; 10 specimens (Fig. 7, row 17). Bead surfaces are shiny.

Length: 12.8-14.5 mm Diameter: 5.9-6.6 mm

Wlc*(h) Oval; translucent bright blue; 4 specimens (Fig. 1, left column, row 12). The glass is swirled and practically opaque.

Length: 13.0-14.3 mm Diameter: 6.8-7.8 mm

Wlc*(i) Oval; translucent robin's egg blue; 9 specimens (Fig. 7, row 5). Surfaces are shiny.

Length: 14.1-16.5 mm Diameter: 7.6-8.6 mm

Wlc*(j) Oval; translucent light aqua blue; 4 specimens (Fig. 1, left column, row 7).

Length: 12.9-15.4 mm Diameter: 7.67-8.3 mm

Wlc*(k) Oval; large size; translucent apple green; 12 specimens (Fig. 1, left column, row 4; Fig. 7, row 25). There are swirls in the glass and the surfaces are shiny. Two size populations are represented.

Length: 15.5-20.0 mm Diameter: 6.3-6.9 mm
14.0-16.9 mm 8.2-9.1 mm

WIIb -- Monochrome Flat "Disc" Beads

WIIb*(a) Flat "disc" beads; transparent dark green; 6 specimens (Fig. 2, central column, row 5). These consist of round beads pressed flat while the glass was still viscid.

Length: 7.0-8.6 mm Diameter: 4.2-4.9 mm by 9.3-11.3 mm

WIIf -- Monochrome "Ridged Tube" Beads; Tubular Beads with Rectangular Pressed Facets Running Entire Length of Bead

WIIf*(a) Ridged tube (square cross-section); transparent bright navy; 5 specimens (Fig. 2, left column, row 13). Their sides exhibit a "waffle iron" design.

Length: 7.3-8.5 mm Diameter: 6.6-7.3 mm

WIIk -- Monochrome Circular Convex Bicone Beads; Beck's (1928) Type I.B.1.e.

WIIk*(a) Circular convex bicone; opaque white; 22 specimens (Fig. 4, left column, row 3; Fig. 5, row 14). Their surfaces are shiny.

Length: 5.7-6.2 mm Diameter: 15.4-16.2 mm

WIIk*(b) Circular convex bicone; opaque light gold; 5 specimens (Fig. 4, left column, row 2). Their surfaces are dull.

Length: 5.0-7.1 mm Diameter: 16.2-17.0 mm

WIIk*(c) Circular convex bicone; opaque cinnamon; 29 specimens (Fig. 4, central column, row 1; Fig. 5, row 1). They have a dull lustre.

Length: 4.5-5.4 mm Diameter: 13.7-14.8 mm

WIII -- Monochrome Standard Circular Truncated Convex Bicone Beads; Beck's (1928) Type I.C.1.f.

WIII*(a) Standard circular truncated convex bicone; opaque light gold; 6 specimens (Fig. 4, central column, row 5). They have dull surfaces.

Length: 9.4-10.3 mm Diameter: 9.9-11.0 mm

WIIIa -- Class WI Beads with a Surface Coating of a Different Colour or Material

WIIIa*(a) Round; translucent oyster white body covered with an interconnected series of identically coloured, approximately 0.8-mm-wide glass filament rings which encircle the bead perpendicular to the perforation; the equator is further decorated with 2-3 translucent rose

wine rings which rest on the oyster white ones; 5 specimens (Fig. 3, right column, row 5).

Length: 7.3-7.9 mm Diameter: 7.4-8.5 mm

WIIIa*(b) Round; transparent scarlet outer layer; opaque white core; 21 specimens (Fig. 1, central column, row 11, and right column, row 8; Fig. 5, rows 2 and 15). Two size populations are represented.

Length: 12.6-13.1 mm Diameter: 13.2-13.5 mm
16.7-16.8 mm 19.5-19.8 mm

WIIIa*(c) Oval; transparent scarlet outer layer; opaque white core; 14 specimens (Fig. 1, left column, row 6; Fig. 7, row 2).

Length: 10.2-11.8 mm Diameter: 6.4-7.6 mm

WIIIb -- Class WI Beads with Inlaid Decoration

WIIIb*(a) Cylindrical; translucent light gray body decorated with a compound stripe of transparent scarlet on opaque white around the middle, and 4 compound dots of transparent bright navy and opaque white glass swirled together around either end; 5 specimens (Fig. 4, left column, row 6). Bead surfaces are shiny.

Length: 9.2-11.0 mm Diameter: 5.6-6.0 mm

WIIIb*(b) Cylindrical; opaque light gold body decorated with 9 transparent scarlet dots, and 9 short, compound stripes of transparent bright navy on opaque white on opaque barn red on opaque dark rose brown which are perpendicular to the perforation; 13 specimens (Fig. 4, right column, row 6; Fig. 6, row 12). Their surfaces are shiny.

Length: 14.2-15.4 mm Diameter 9.0-10.1 mm

WIIIb*(c) Cylindrical; opaque light gold body decorated with 2 opaque barn red and 2 translucent dark palm green, straight, simple stripes which alternate around the bead; a translucent dark palm green stripe encircles the middle; a dot of the same colour is situated in the centre of each of the square areas produced by the intersecting stripes; 4 specimens (Fig. 4, right column, row 3). The beads have a dull lustre.

Length: 12.0-13.3 mm Diameter: 7.8-8.4 mm

WIIIb*(d) Cylindrical; opaque mustard gold body decorated with 2 pairs of loops composed of a translucent dark palm green stripe next to an opaque white stripe next to a transparent scarlet stripe; the two sets of loops are separated from each other by a short, diagonal, compound stripe of transparent bright navy next to opaque white; the loops in each set are separated from each other by two translucent dark palm green dots; 4 specimens (Fig. 4, right column, row 5). The specimens have dull surfaces.

Length: 14.2-15.0 mm Diameter: 7.7-7.8 mm

WIIIb*(e) Cylindrical; opaque mustard gold body decorated with (1) a spiral, compound stripe of opaque mustard gold (formed by the body

of the bead) bordered on one side by an opaque barn red stripe and by an opaque dark palm green stripe on the other; (2) a wavy, spiral, compound stripe of opaque white and transparent scarlet filaments twisted together; (3) 15-17 scattered, opaque dark rose brown dots; 7 specimens (Fig. 4, right column, rows 2 and 4). The beads, all of which are dull-surfaced, represent two size populations.

Length:	14.3-14.7 mm	Diameter:	7.5-8.0 mm
	15.7-16.8 mm		9.1-9.6 mm

WIIIb*(f) Cylindrical; opaque barn red body decorated with approximately 20 opaque white loops with an opaque light gold dot or dash in the centre of each; 11 specimens (Fig. 4, right column, row 1; Fig. 5, row 10). Their surfaces are dull.

Length: 18.0-19.9 mm Diameter: 8.1-8.9 mm

WIIIb*(g) Cylindrical; translucent bright navy body decorated with 3 compound dots of transparent scarlet on opaque white which encircle the middle, and 3 opaque light gold dots around either end; 4 specimens (Fig. 4, left column, row 4). The bright navy glass appears black unless held up to a light and its surface is dull.

Length: 6.2-7.3 mm Diameter: 4.6-5.0 mm

WIIIb*(h) Round; opaque white body decorated with 6-9 transparent bright navy dots; 3 specimens (Fig. 1, central column, row 1).

Length: 10.5-11.7 mm Diameter: 12.8-13.4 mm

WIIIb*(i) Round; opaque white body decorated with 2 transparent scarlet and 2 transparent bright navy floral motifs set parallel to the axis of the perforation; 11 specimens (Fig. 7, row 4). Surfaces are shiny.

Length: 10.3-11.7 mm Diameter: 8.9-9.5 mm

WIIIb*(j) Round; translucent light gray body decorated with 6 transparent bright navy dots; 3 specimens (Fig. 1, right column, row 7).

Length: 9.5-12.0 mm Diameter: 13.7-13.9 mm

WIIIb*(k) Round; opaque black body decorated with a combed design of transparent ruby on opaque white; 1 specimen (Fig. 1, left column, row 1).

Length: 14.8 mm Diameter: 15.1 mm

WIIIb*(l) Round; opaque black body decorated with approximately 25 compound dots or eyes of transparent scarlet on opaque white and opaque turquoise on opaque white; 14 specimens (Fig. 1, right column, row 6; Fig. 7, row 20).

Length: 11.1-11.3 mm Diameter: 10.6-11.0 mm

WIIIb*(m) Round; transparent scarlet body decorated with 8 large, opaque white dots; 13 specimens (Fig. 7, row 13).

Length: 6.9-9.6 mm Diameter: 7.7-9.5 mm

WIIIb*(n) Round; transparent ruby body decorated with 11 com-

pound dots of transparent scarlet on opaque white; 1 specimen (Fig. 1, left column, row 3).
Length: 16.3 mm Diameter: 18.0 mm

WIIIb*(o) Round; transparent ruby body decorated with 6 floral motifs set parallel to the perforation: 3 motifs have opaque white leaves and opaque russet orange stalks; the others are solid russet orange; 12 specimens (Fig. 1, right column, row 12; Fig. 6, row 4).
Length: 14.0-15.4 mm Diameter: 16.0-16.4 mm

WIIIb*(p) Oval; opaque white body decorated with 4 floral motifs set parallel to the perforation; 2 motifs have transparent scarlet leaves and faint opaque bright navy stalks; the other two motifs are solid bright navy; 12 specimens (Fig. 2, central column, row 6; Fig. 7, row 15).
Length: 14.3-15.1 mm Diameter: 7.8-8.4 mm

WIIIb*(q) Oval; transparent ruby body decorated with (1) a compound, spiral stripe composed of entwined opaque white and transparent bright navy filaments, and (2) a spiral series of 10 compound dots of opaque white and transparent bright navy swirled together; 11 specimens (Fig. 2, central column, row 7; Fig. 7, row 18).
Length: 14.7-15.4 mm Diameter: 8.3-8.5 mm

WIIIb*(r) Oval (barrel-shaped); opaque light gold body decorated with 3 straight, compound stripes of transparent bright navy on opaque white on opaque barn red, and a compound stripe of opaque barn red on opaque white on opaque dark palm green which encircles the middle and extends over the other stripes; 3 specimens (Fig. 4, central column, row 2). Bead surfaces are dull.
Length: 11.7-12.2 mm Diameter: 7.8 mm

WIIIb*(s) Oval (barrel-shaped); opaque cinnamon body decorated with 3 straight, compound stripes of transparent bright navy on opaque white on opaque barn red; an identical stripe encircles the middle and extends over the other stripes; 14 specimens (Fig. 4, central column, row 3; Fig. 6, row 11). Beads have a dull lustre.
Length: 11.7-12.1 mm Diameter: 8.8-9.5 mm

WIIIb*(t) Oval (barrel-shaped); opaque cinnamon body decorated with 8 short, straight, compound stripes of transparent bright navy on opaque white on opaque barn red, and a compound stripe of transparent bright navy on opaque white on opaque barn red on translucent dark palm green which girds the equator; 4 specimens (Fig. 4, right column, row 7). Bead surfaces are dull.
Length: 14.6-15.7 mm Diameter: 10.6-11.4 mm

WIIIc -- Class WII Beads with an Inlaid Decoration

WIIIc*(a) Flat "disc" beads; opaque mustard gold body decorated with 16 loops composed of a transparent dark rose brown stripe next to

an opaque orchid mist stripe; a compound dot of transparent bright navy and opaque white swirled together occupies the centre of each loop; 16 translucent dark palm green dots occupy the interstices between the loops; 11 specimens (Fig. 4, right column, row 9; Fig. 5, row 5). Beads have dull surfaces.

Length: 16.2-17.0 mm Diameter: 6.5- 7.0 mm by 19.4-19.7 mm

WIIIc*(b) Flat "disc" beads; opaque mustard gold body decorated with several elements: (1) a wavy, compound stripe of bright turquoise and opaque white filaments twisted together encircles the middle and is bordered by 10 near opaque dark rose brown dots; (2) 5 loops of opaque white on transparent scarlet with a compound dot of transparent dark palm green and opaque white swirled together in the centre of each encircle either end; (3) identical dots occupy the spaces between adjacent loops; 12 specimens (Fig. 4, right column, row 8; Fig. 5, row 7). Surfaces are dull.

Length: 14.6-16.3 mm Diameter: 6.1- 6.9 mm by 16.4-17.6 mm

WIIIc*(c) Flat "disc" beads; opaque deep blue body decorated with 16 loops composed of transparent scarlet and opaque white threads twisted together; an opaque mustard gold dot is situated in the centre of each loop; 16 opaque white dots cover the rest of the surface; 11 specimens (Fig. 4, right column, row 10; Fig. 5, row 6). Their surfaces are dull.

Length: 17.1-17.5 mm Diameter: 7.0- 7.2 mm by 19.2-20.0 mm

WIIIc*(d) Short circular barrel (Beck's type I.B.1.b.); opaque sunlight yellow body; a compound stripe of transparent dark jade green and transparent scarlet on opaque white encircles the middle; a compound stripe composed of a series of short, alternating transparent dark jade green and scarlet diagonals on an opaque white background encircles either end; 5 specimens (Fig. 4, central column, row 4). They exhibit a dull lustre.

Length: 7.4-8.0 mm Diameter: 11.6-13.7 mm

WIIIc*(e) Short circular barrel (Beck's type I.B.1.b.); opaque aqua blue body decorated with 5 compound dots of transparent scarlet on opaque white which gird the middle, and 5 compound dots of transparent bright navy on opaque white around either end; 8 specimens (Fig. 4, left column, row 8). Surfaces are dull.

Length: 5.1-5.8 mm Diameter: 7.5-8.8 mm

WIIIc*(f) Short circular barrel (Beck's type I.B.1.b.); opaque surf green body decorated with a compound stripe of transparent scarlet on opaque white encircles the middle and is bordered on either side by a wavy, opaque mustard gold stripe; 10 translucent rose wine dots are situated in the area between the central stripe and the lateral ones; 5

opaque white dots encircle either end; 5 specimens (Fig. 4, left column, row 7). They have a dull lustre.

Length: 5.9-6.4 mm Diameter: 10.8-12.9 mm

VIIIc*(g) Short circular truncated convex bicone (Beck's type I.B.1.f.); opaque light gold body decorated with 2 identical sets of very narrow, straight, simple stripes: an opaque barn red stripe situated between two translucent dark palm green stripes; a very narrow, opaque barn red stripe extends along the equatorial ridge; 4 specimens (Fig. 4, central column, row 9). Surfaces are dull.

Length: 14.3-14.7 mm Diameter: 17.0-18.0 mm

VIIIc*(h) Standard circular truncated convex bicone (Beck's type I.C.1.f.); opaque black body decorated with 6 irregular, opaque cinnamon blotches with an opaque barn red loop in the centre of each; 13 specimens (Fig. 4, central column, row 6; Fig. 5, row 9). Surfaces are dull.

Length: 15.7-16.0 mm Diameter: 15.1-15.5 mm

VIIIc*(i) Standard circular truncated convex bicone (Beck's type I.C.1.f.); opaque black body decorated with 8 eyes composed of an opaque bright blue dot enclosed by an opaque mustard gold ring with 2 crossed compound stripes of opaque black next to opaque mustard gold next to opaque barn red in the centre of each; a compound stripe of opaque mustard gold on opaque barn red extends around the equator, and an opaque white ring encircles either end; 4 specimens (Fig. 4, central column, row 7). Surfaces are shiny.

Length: 15.7-16.3 mm Diameter: 15.2-16.6 mm

VIIIc*(j) Standard circular truncated convex bicone (Beck's type I.B.1.f.); opaque cinnamon body decorated with 4 straight, compound stripes of translucent dark palm green on opaque cinnamon bordered on one side by an opaque barn red stripe and by an opaque dark rose brown stripe on the other; a translucent dark palm green stripe girds the middle and extends over the compound stripes; 11 specimens (Fig. 4, central column, row 10; Fig. 5, row 4). They have a dull lustre.

Length: 16.0-16.2 mm Diameter 17.7-19.0 mm

VIIIc*(k) Standard circular truncated convex bicone (Beck's type I.C.1.f.); opaque dark jade green body decorated with 3 to usually 4 straight, compound stripes of opaque light gold bordered on one side by an opaque black stripe and by an opaque barn red stripe on the other; an opaque light gold stripe extends along the equatorial ridge and crosses the other stipes; 4 specimens (Fig. 4, central column, row 8). Beads have dull surfaces, and ends are irregular and not very wide.

Length: 13.7-15.0 mm Diameter: 14.3-16.5 mm

VIIIc*(l) Standard circular truncated convex bicone (Beck's type I.C.1.f.); opaque dark palm green body decorated with 4 straight, compound stripes of opaque light gold bordered on one side by an opaque black stripe and by an opaque barn red stripe on the other; an opaque

light gold stripe encircles the equator and extends over the other stripes; 1 specimen (Fig. 4, left column, row 1). Surfaces are dull and ends are irregular and not very wide.

Length: 16.9 mm Diameter: 18.1 mm

WIIIc*(m) Ridged tube (square cross-section); translucent oyster white body decorated with 6 very short, compound stripes of translucent oyster white on transparent bright navy with an opaque amber dot in the approximate centre of each stripe; the stripes are perpendicular to the axis of the perforation; 9 specimens (Fig. 4, left column, row 9; Fig. 5, row 8). The beads have shiny surfaces. They are equivalent to Beck's (1928) long square cylinders (type IX.D.2.b.).

Length: 18.6-18.8 mm Diameter: 8.1-9.1 mm

WIIIc*(n) Ridged tube (triangular to square cross-section); opaque black body decorated with a wavy, opaque amber stripe around the middle, and a wavy, opaque white stripe around either end; 5 specimens (Fig. 4, left column, row 5). These are the equivalent of Beck's (1928) long square cylinder (type IX.D.2.b.) and long triangular cylinder (type VIII.D.2.b). Surfaces are shiny.

Length: 9.1-10.1 mm Diameter: 5.4-5.9 mm

WIIIf -- Class WI Beads with Internal Decorative Elements

WIIIf*(a) Round; translucent maple body decorated internally with slightly spiral, opaque white glass bands which encircle the perforation; 2 specimens (Fig. 1, left column, row 2).

Length: 14.0-15.4 mm Diameter: 14.7-16.8 mm

WIIIf*(b) Round; translucent dark green body decorated internally with slightly spiral, opaque white glass bands which encircle the perforation; 4 specimens (Fig. 1, right column, row 10).

Length: 11.0-11.6 mm Diameter: 12.0-13.2 mm

MOULD-PRESSED BEADS

These beads were manufactured by pressing molten glass in a two-piece mould and then letting it harden. The surfaces of most specimens were subsequently modified by grinding.

MPIa -- Monochrome Round Beads

MPIa*(a) Round; translucent sunlight yellow; 9 specimens (Fig. 7, row 23). The beads have slight equatorial bulges, and their perforations taper noticeably. They have shiny surfaces.

Length: 11.0-12.2 mm Diameter: 13.3-13.9 mm

MPIIa -- Monochrome Round-Faceted Beads

MPIIa*(a) Round-faceted; translucent sunlight yellow; 4 specimens (Fig. 3, right column, row 1). The beads are covered with numerous, poorly cut, irregular facets. The perforation tapers noticeably.

Length: 11.5-12.0 mm Diameter: 13.6-14.3 mm

MPIIa*(b) Round-faceted; translucent amber; 7 specimens (Fig. 6, row 3). Numerous cut diamond-shaped facets cover the medial portion, whereas cut pentagonal facets extend around the flat ends.

Length: 19.4-20.0 mm Diameter: 23.8-25.0 mm

MPIIa*(c) Round-faceted; opaque bright Dutch blue; 5 specimens (Fig. 3, right column, row 3). This variety has approximately 26 diamond-shaped cut facets around the middle, and 8-10 irregular pentagonal cut facets at either end. The perforation is tapered and the ends are flat.

Length: 7.9-9.2 mm Diameter: 10.1-10.8 mm

MPIIa*(d) Round-faceted; opaque dark green; 4 specimens (Fig. 3, right column, row 2). This variety exhibits 54-60 neatly cut facets: 36-40 triangular facets around the middle, and 9-10 trapezoidal facets about either end. The perforations taper and the ends are flat.

Length: 10.8-11.3 mm Diameter: 12.6-13.1 mm

MPIIb -- Monochrome Long Hexagonal Barrel Beads; Beck's (1928) Type XIII.D.1.b.

MPIIb*(a) Long hexagonal barrel; translucent light gray; 4 specimens (Fig. 3, left column, row 1; Fig. 6, row 6). This variety has a cut, hexagonal-sectioned body which tapers gradually towards either flat end. The glass contains elongate bubbles parallel to the axis of the perforation.

Length: 52.0 mm Diameter: 13.3 mm

MPIIb*(b) Long hexagonal barrel; translucent deep blue; 1 specimen (Fig. 6, row 2). This bead has the same form as the previous one.

Length: 105.0 mm Diameter: 20.8 mm

STONE BEADS

All of the specimens are made of banded carnelian.

Long circular barrel (Beck's type I.D.1.b.); 7 specimens (Fig. 6, row 10). The beads have polished surfaces.

Length: 19.2-22.9 mm Diameter: 6.7-7.8 mm

Long octagonal cone (Beck's type XIV.D.2.d); 10 specimens (Fig. 6, rows 8 and 9). The ends of every other facet have been ground down. The surfaces are polished. Two size populations are represented.

Length:	24.4-28.7 mm	Diameter:	8.3-9.9 mm
	40.0-43.2 mm		9.1-11.4 mm

Discussion and Conclusions

Although the exact date the display cards and boxes that make up the Levin Catalogue were prepared is not known, fairly narrow relative dates can be assigned to the two component collections. The four display cards are attributable to 1851-63. The latter year corresponds to the cards' museum accession date, whereas 1851 is the first year that M. L. Levin is recorded as being at the Bevis Marks address which appears on the bead cards. The three display boxes can be ascribed to 1857-69. The former date is based on the presence of the city zoning designation "E.C." after the address on the display case labels. The use of such zones in London street addresses appears to have been implemented in 1857 (Kelly 1857). The other terminal date is founded on the fact that the designation "manufacturer," which appears after Levin's name on the box labels, is deleted from the London city directory listings after 1869. This implies the bead boxes were assembled before this date. Many of the beads themselves have counterparts at similarly dated archaeological sites in North America, suggesting the specimens exhibited in the Levin Catalogue represent current rather than old stock.

The source of the beads is problematic. Although the country of origin for the various types remains undetermined, they were probably produced in Venice, Bohemia and/or Germany, all of which supplied beads to Levin during the 1890s and early 1900s (Kelly 1898: 1230; 1911: 1029).

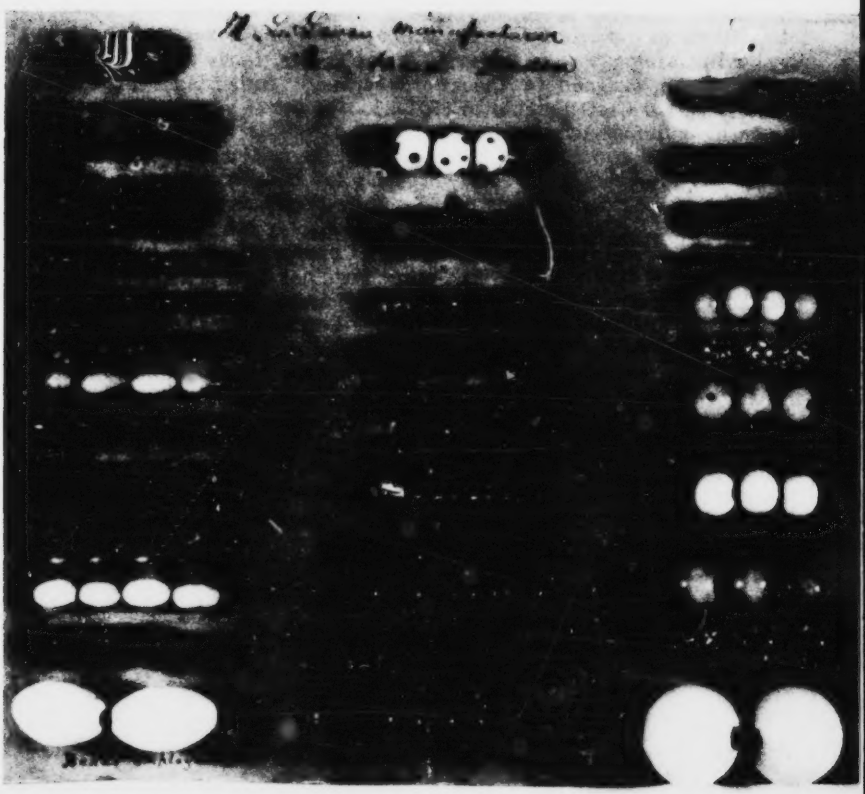

Figure 1. Sheet no. 1 of the 1863 collection: "Beads employed in the African Trade for ivory." (Reproduced by courtesy of the Trustees of the British Museum)

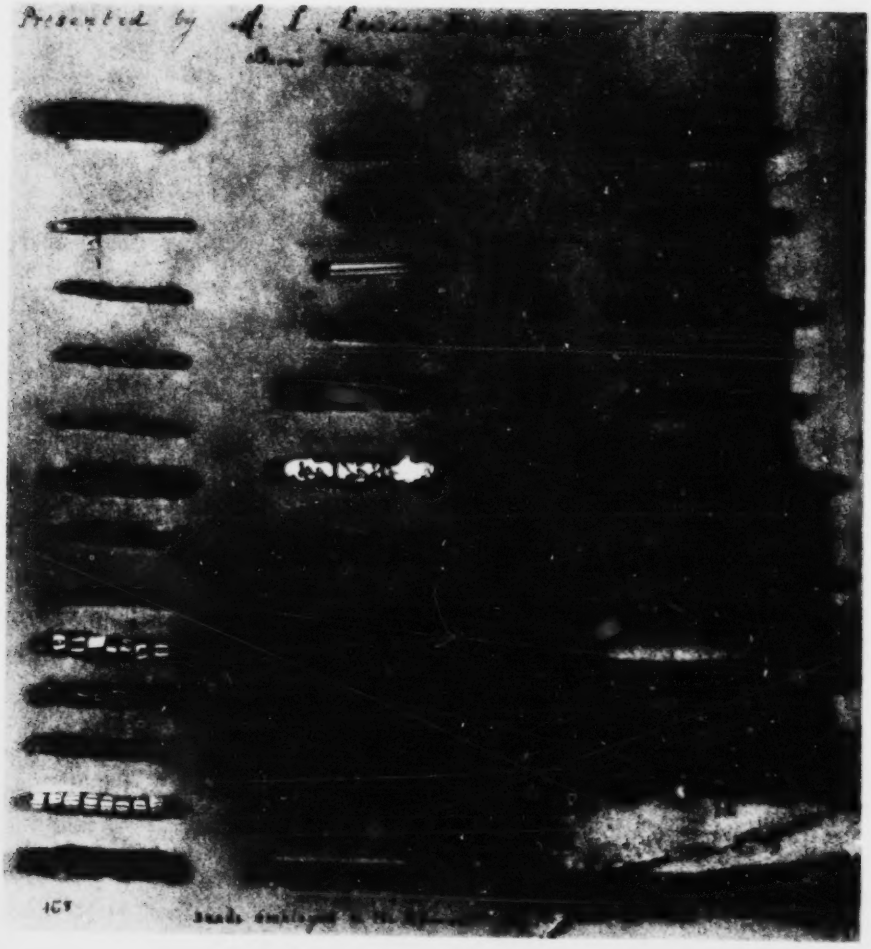

Figure 2. Sheet no. 2 of the 1863 collection: "Beads employed in the African Trade, for palm oil." (Reproduced by courtesy of the Trustees of the British Museum)

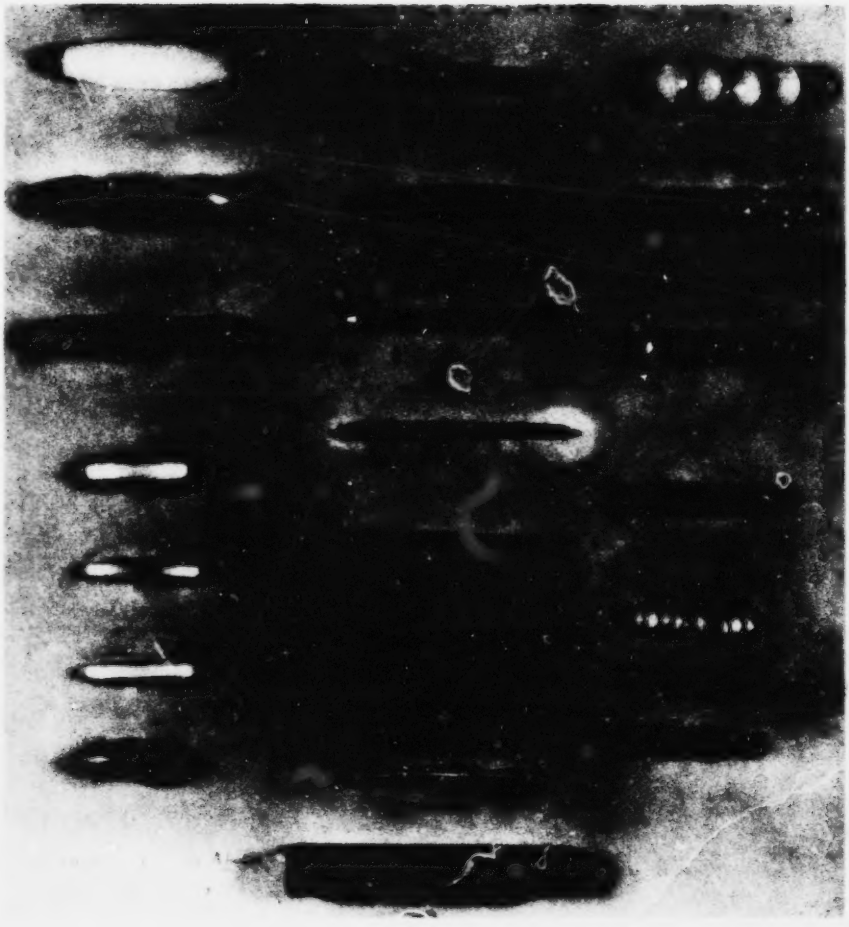

Figure 3. Sheet no. 3 of the 1863 collection: "Beads used in the African Trade, for slaves." (Reproduced by courtesy of the Trustees of the British Museum)

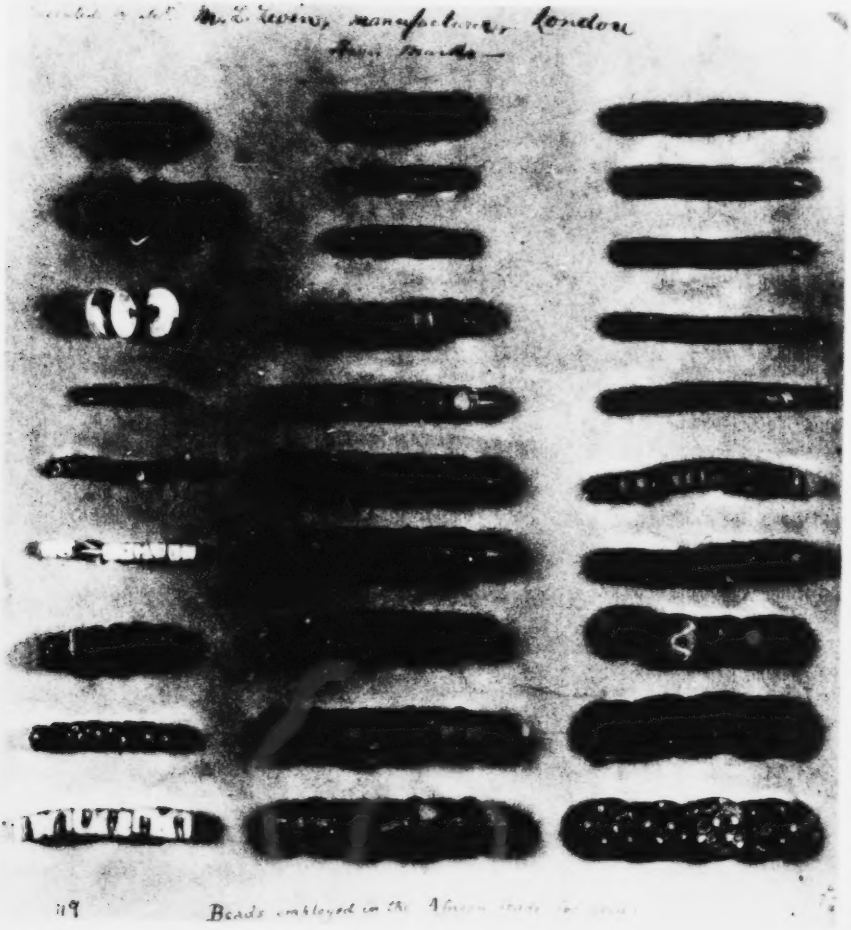

Figure 4. Sheet no. 4 of the 1863 collection: "Beads employed in the African Trade for gold." (Reproduced by courtesy of the Trustees of the British Museum)

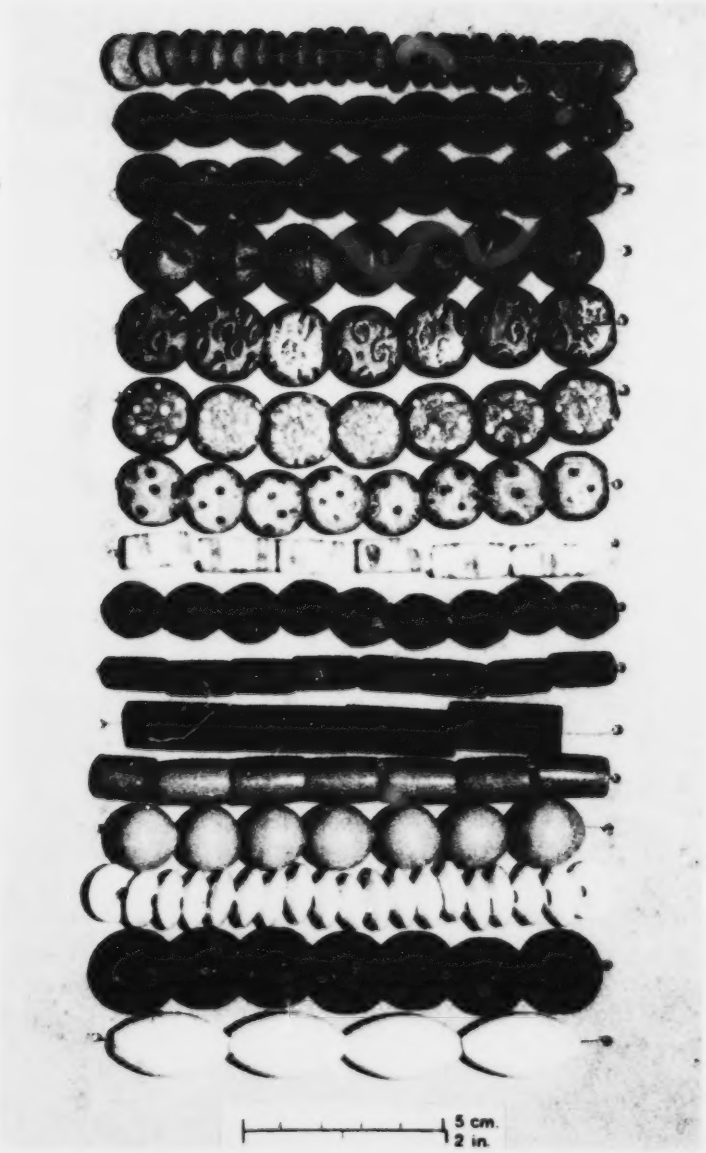

Figure 5. Box A of the 1960 collection: "Beads such as are used by Traders in West Africa, & given in exchange for Palm Oil & other African produce." (Photo by Lester A. Ross)

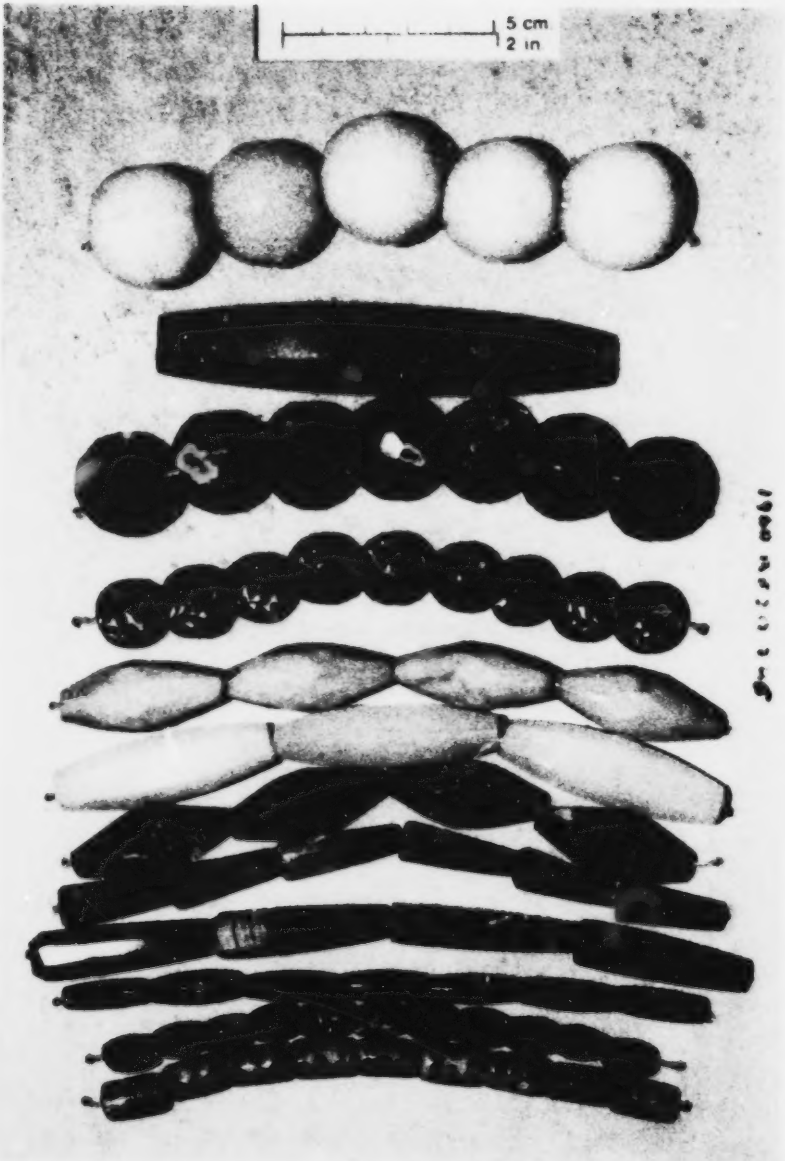

Figure 6. Box B of the 1960 collection: "Beads such as are used by Traders in West Africa, & given in exchange for Palm Oil & other African produce." (Photo by Lester A. Ross)

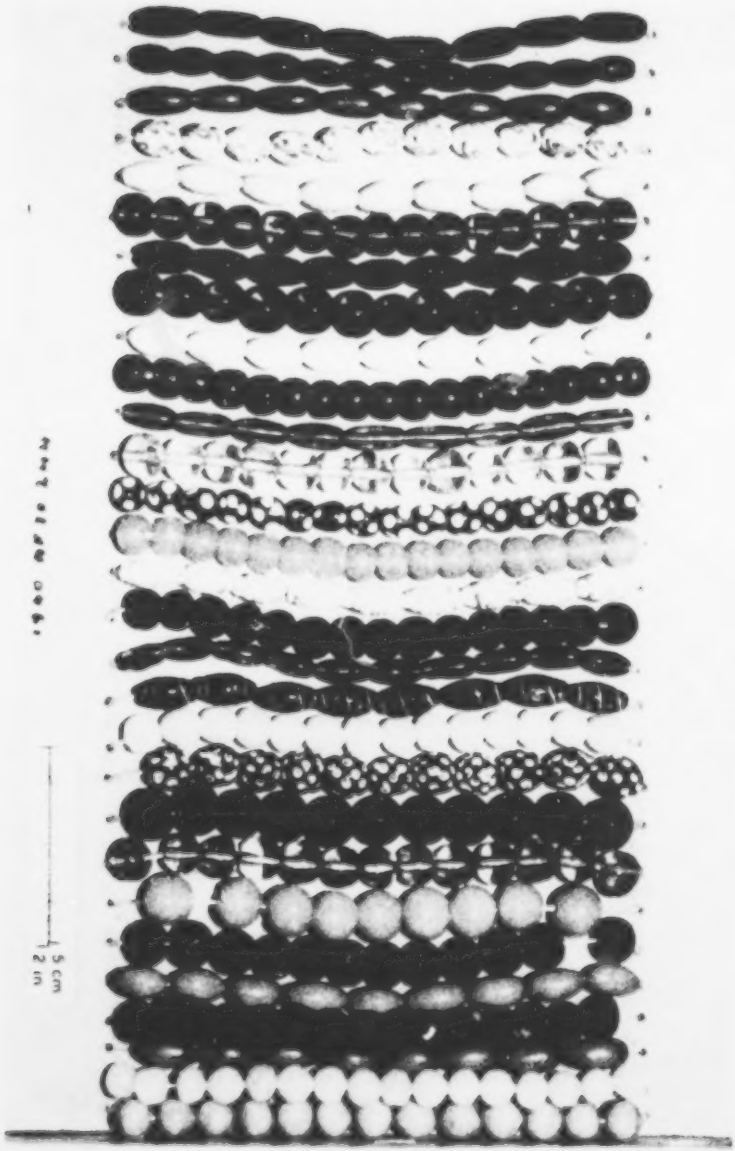

Figure 7. Box C of the 1960 collection: "Beads such as have been used by Traders in West Africa as barter for Palm Oil and other African produce." (Photo by Lester A. Ross)

APPENDIX A. LEVIN CATALOGUE BEAD INDEX

Figure 1 (Sheet 1)

Left column, row		Central column, row		Right column, row	
1	WIIIb*(k)	1	WIII*b(h)	1	Wb*(j)
2	WIIIf*(a)	2	Wb*(f)	2	Wb7
3	WIIIb*(n)	3	Wb*(a)	3	Wb*(j)
4	Wlc*(k)	4	Wb16	4	Wb*(g)
5	Wlc*(e)	5	Wb*(k)	5	Wb5
6	WIIIa*(c)	6	Wb*(e)	6	WIIIb*(l)
7	Wlc*(j)	7	Wb1	7	WIIIb*(j)
8	Wlc*(c)	8	Wb*(h)	8	WIIIa*(b)
9	Wlc*(d)	9	Wb*(l)	9	Wb*(b)
10	Wlc*(f)	10	Wb*(d)	10	WIIIf*(b)
11	Wlc5	11	WIIIa*(b)	11	Wb*(i)
12	Wlc*(h)			12	WIIIb*(o)
13	Wlc*(a)			13	Wb5
14	Wlc*(b)				
15	Wlc(a)				

Figure 2 (Sheet 2)

Left column, row		Central column, row		Right column, row	
1	Ia19	1	Ia*(a)	1	Ia*(e)
2	Ia*(d)	2	Ia*(c)	2	Ia16
3	IVbb*(b)	3	Ib*(a)	3	IIIb'*(a)
4	IIb*(a)	4	Ia*(b)	4	Ib'*(a)
5	IVbb*(b)	5	WIIb*(a)	5	IIIa5
6	IIIk*(a)	6	WIIIb*(p)	6	IIIk*(b)
7	IVb*(b)	7	WIIIb*(q)	7	IIIa5
8	IIb*(b)	8	WIa*(b)	8	WIa*(a)
9	IVbb*(a)	9	Ia*(c)	9	IIIa*(a)
10	IVb*(b)	10	Ibb'*(a)		
11	IVa*(a)	11	Ibb'*(b)		
12	IVb*(a)	12	IIIbb'*(a)		
13	WIIf*(a)				

Figure 3 (Sheet 3)

Left column, row		Central column, row		Right column, row	
1	MPIIb*(a)	1	IIIf*(c)	1	MPIIa*(a)
2	If*(c)	2	If*(b)	2	MPIIa*(d)
3	IIIf*(d)	3	Io*(d)	3	MPIIa*(c)
4	IIIf*(e)	4L	Io*(a)	4	IIIf*(a)
5	IIIf*(f)	4R	Io*(b)	5	WIIIa*(a)
6	IIIf*(e)	5	Io*(e)	6	If*(a)
7	If*(d)	6	Io*(c)		
		7	IIIf*(b)		
		8	If*(f)		
		9	IIIc*(a)		

Figure 4 (Sheet 4)

Left column, row		Central column, row		Right column, row	
1	WIIIc*(l)	1	WIIk*(c)	1	WIIIb*(f)
2	WIIk*(b)	2	WIIIb*(r)	2	WIIIb*(e)
3	WIIk*(a)	3	WIIIb*(s)	3	WIIIb*(c)
4	WIIIb*(g)	4	WIIIc*(d)	4	WIIIb*(e)
5	WIIIc*(n)	5	WIII*(a)	5	WIIIb*(d)
6	WIIIb*(a)	6	WIIIc*(h)	6	WIIIb*(b)
7	WIIIc*(f)	7	WIIIc*(i)	7	WIIIb*(t)
8	WIIIc*(e)	8	WIIIc*(k)	8	WIIIc*(b)
9	WIIIc*(m)	9	WIIIc*(g)	9	WIIIc*(a)
		10	WIIIc*(j)	10	WIIIc*(c)

Figure 5 (Box A)

Row		Row		Row		Row	
1	WIIk*(c)	5	WIIIc*(a)	9	WIIIc*(h)	13	Wb*(i)
2	WIIIa*(b)	6	WIIIc*(c)	10	WIIIb*(f)	14	WIIk*(a)
3	Wb*(b)	7	WIIIc*(b)	11	IIIa*(a)	15	WIIIa*(b)
4	WIIIc*(j)	8	WIIIc*(m)	12	WIa*(a)	16	WIcl

Figure 6 (Box B)

Row		Row		Row		Row	
1	Wb5	4	WIIIb*(o)	7	If*(c)	10	stone (A)
2	MPIIb*(b)	5	If*(e)	8	stone (B)	11	WIIIb*(s)
3	MPIIa*(b)	6	MPIIb*(a)	9	stone (B)	12	WIIIb*(b)

Figure 7 (Box C)

Row		Row		Row		Row	
1	Wlc*(d)	9	Wlc*(a)	17	Wlc*(g)	25	Wlc*(k)
2	WIIIa*(c)	10	Wb*(j)	18	WIIIb*(q)	26	Wb*(k)
3	Wlc*(f)	11	Wlc5	19	Wb(c)	27	Wlc*(c)
4	WIIIb*(i)	12	Wbl	20	WIIIb*(l)	28	Wb5
5	Wlc*(i)	13	WIIIb*(m)	21	Wb*(h)	29	Wb*(j)
6	Wb7	14	Wb*(l)	22	Wb*(a)		
7	Wlc*(b)	15	WIIIb*(p)	23	MPIIa*(a)		
8	Wb16	16	Wb*(f)	24	Wb*(d)		

A SAMPLE BOOK OF 19TH CENTURY VENETIAN BEADS

Abstract

Housed in the Museum of Mankind, London, the manufacturer's or dealer's sample book treated herein contains 16 tray-like pages which display 380 varieties of wound, drawn and mould-pressed glass beads, as well as a non-glass bead and three cabochons. Purportedly originating in Venice in 1704, research has revealed that although most, if not all, of the beads are probably of Venetian manufacture, the 1704 date is much too early, the collection being attributed to the second half of the 19th century.

Introduction

Measuring 40 cm long, 23 cm wide and 16.5 cm thick, the bead book is bound in brown leather and contains 16 tray-like pages of cardboard edged with wood. Penned upon the pages in dark brown ink are 676 consecutively numbered, rectangular spaces which display 380 varieties of glass beads, one non-glass bead fragment and three cabochons. The glass specimens are of wound (356 varieties), drawn (13 varieties) and mould-pressed (11 varieties) manufacture.

The wound beads that make up the bulk of the bead book were produced by winding strands of viscid glass around a rotating metal mandrel until the desired size and shape were achieved. Layered specimens were formed by winding one colour over another, whereas those with swirled bodies were fashioned using strands pulled from multi-layered rods. While still soft, most of the beads were either pressed with small metal paddles to impart a specific shape, or decorated with inlays or appliqués of glass or gilt. When cool, they were stripped from the mandrel which may have been covered with either chalk, graphite or clay to facilitate this step.

The drawn category is represented solely by "chevron" beads produced by forming a hollow globe of several differently coloured and corrugated layers of molten glass and drawing it out into a long tube. If stripes were desired, coloured glass rods or globs were affixed to the globe before it was drawn out. When cool, the tube was broken into manageable sections which were then sorted according to their diameter. These were subsequently cut into bead lengths by placing them on a sharp, broad chisel set in a block of wood and striking them with a blunt-edged, nearly triangular plate of steel (Anonymous 1825: 120; 1835: 79). Finally, the ends of the resultant beads were ground at an angle to expose the pattern of the various layers.

The mould-pressed beads were made by clamping a glob of molten glass in a two-piece mould and then letting it harden. A pin that extended the length of the mould created the perforation. After their removal from the mould, the beads had their facets smoothed by grinding.

Of wound manufacture unless otherwise noted, the beads described on the following pages are classified using an expanded version of the Kidds' (1970) system as presented in Karklins (1982). An asterisk (*) denotes bead varieties not recorded by the Kidds. Measurements (length: L; diameter: D; thickness: T) are in millimetres and the range is followed by the mean. Shape nomenclature is based on Kidd and Kidd (1970) and Beck (1928), whereas the colour names correspond to those employed in the *Color Harmony Manual* (Container Corporation of America 1958). The Colour Harmony codes for these names and their equivalents in the Munsell colour notation system (Munsell Color 1976) are presented in Table 1.

The diaphaneity of the beads is described using the terms opaque (op.), translucent (tsl.) and transparent (tsp.). Simply defined, beads classified as opaque are impenetrable to light except on the thinnest

Table 1. Bead book colour index.

Color Harmony name	Color Harmony code	Munsell	Equivalent
sunlight yellow	1-1/2 ga	5.0Y	8.5/8
light gold	2 ic	2.5Y	7/8
mustard gold	2 ne	2.5Y	6/8
amber	3 lc	10.0YR	7/8
terra cotta	5 pe	2.5YR	4/10
coral	6 lc	10.0R	5/10
redwood	6 ne	10.0R	4/8
barn red	6 pg	10.0R	3/8
brick red	6-1/2 ne	7.5R	3/8
scarlet	7 pa	7.5R	4/14
dark rose brown	7 pn	2.5YR	2/2
rose wine	8 le	10.0RP	4/6
ruby	8 pc	2.5R	3/10
orchid mist	9 ec	2.5RP	7/4
lilac	11 ge	5.0P	5/4
bright Dutch blue	13 la	7.5PB	4/11
ultramarine	13 pa	6.25PB	3/12
bright navy	13 pg	7.5PB	2/7
copen blue	13-1/2 ic	5.0PB	5/7
bright copen blue	14 ia	2.5PB	6/9
pale blue	15 ca	7.5B	8/2
bright blue	16 lc	5.0B	5/7
medium turquoise blue	17 le	2.5B	5/5
turquoise	17 pa	10.0BG	5/8
aqua green	19 ic	7.5BG	6/6
light blue spruce	20 ge	5.0BG	6/3
turquoise green	20 nc	5.0BG	4/8
teal green	20 ng	5.0BG	3/6
emerald green	21 nc	10.0G	5/10
dark jade green	21 ng	10.0G	4/5
surf green	22 ie	5.0G	5/4
dark green	22 pi	2.5G	3/6
dark palm green	23 ni	10.0GY	4/4
white	a	N	9/0
oyster white	b	N	8/0
light gray	c	N	7/0
black	p	N	1/0

edges. Translucent specimens transmit light, yet diffuse it so that objects viewed through them are indistinct. Objects observed through transparent beads are clearly visible.

Inventory of Bead Varieties

1-47 WIIm and WIIo; short and long square barrel beads (Beck's [1928] types IX.B.1.b. and IX.D.1.b., respectively) with monochrome, square-sectioned bodies that taper toward either end. Their sides are flat to slightly concave. Those of the largest and smallest specimens are formed by an unbroken curve, whereas those of the mid-sized examples are composed of two flat trapezoidal facets that meet at the equator. There are ten colour varieties and five distinct size groups:

1- 5	WIIm* and WIIo*; tsp. scarlet
6-10	WIIm* and WIIo*; op. white
11-15	WIIm* and WIIo*; tsp. rose wine
16-20	WIIm* and WIIo*; op. bright blue
21-25	WIIm* and WIIo*; tsp. bright navy
26-30	WIIm* and WIIo*; op. copen blue
31-35	WIIm* and WIIo*; colourless
36-40	WIIm* and WIIo*; op. black
41-45	WIIm* and WIIo*; tsp. emerald green
46-47	WIIo*; tsp. pale blue (opalescent)

The size groups are as follows (in millimetres):

A. L: 2.0-3.5 (2.6); D: 2.5-3.5 (3.0); Short square barrel
B. L: 3.4-4.7 (4.0); D: 3.1-3.8 (3.4); Long square barrel
C. L: 3.9-5.6 (4.6); D: 3.3-4.4 (3.9); Long square barrel
D. L: 6.8-8.2 (7.2); D: 4.5-5.5 (5.0); Long square barrel
E. L: 7.6-9.4 (8.5); D: 5.2-6.9 (6.1); Long square barrel

48-87 WIc; oval beads with monochrome bodies; eight varieties:

48-52	WIc*; tsp. scarlet
53-57	WIc1; op. white
58-62	WIc*; op. bright blue
63-67	WIc*; op. copen blue
68-72	WIc*; op. black
73-77	WIc*; op. amber
78-82	WIc*; op. dark palm green
83-87	WIc*; tsl. oyster white

The beads come in five distinct sizes (in millimetres):

A. L: 4.0-6.4 (4.9); D: 2.7-3.2 (3.0)
B. L: 4.8-7.0 (5.9); D: 2.8-3.5 (3.2)
C. L: 5.6-8.0 (6.8); D: 3.3-4.0 (3.6)
D. L: 6.6-8.1 (7.3); D: 4.2-5.3 (4.6)
E. L: 8.2-9.4 (8.8); D: 5.0-6.3 (5.7)

88-135 WIb; round beads with monochrome bodies; ten varieties:

88- 92	WIb*; tsp. scarlet
93- 97	WIb2; op. white
98-102	WIb12; op. bright blue
103-107	WIb*; op. copen blue

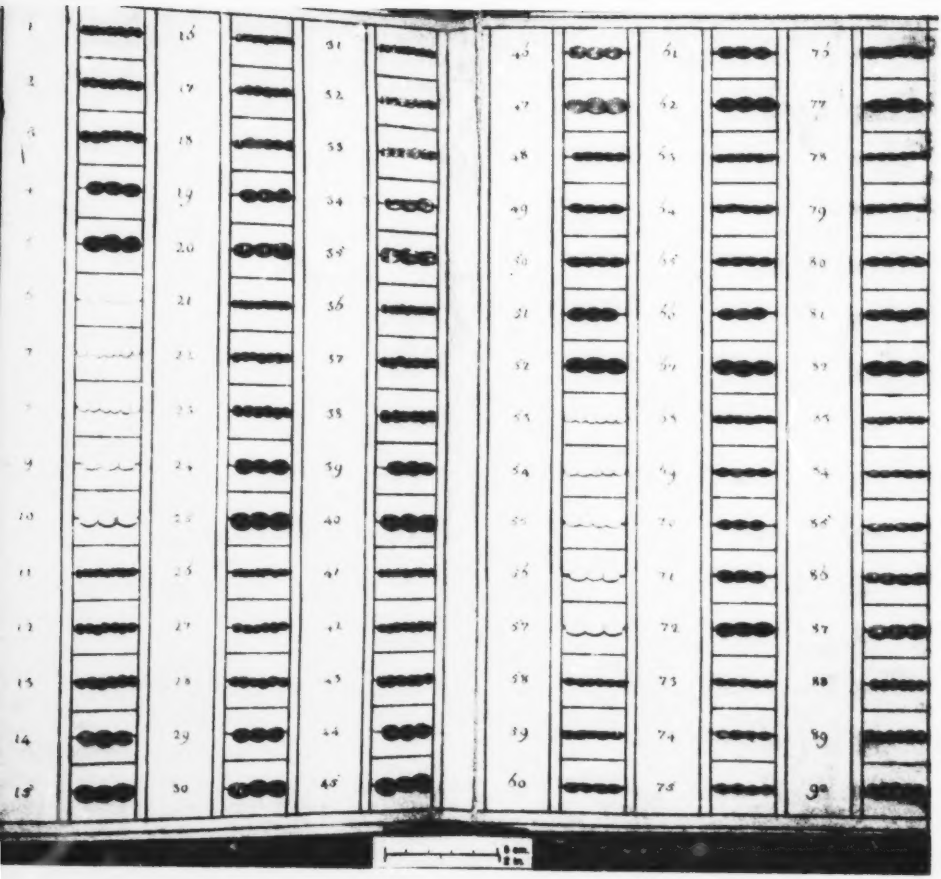

Figure 1. Bead book varieties 1-90. (Photo by Lester A. Ross)

108-112 WIb*; colourless
113-117 WIb*; op. black
118-122 WIb*; op. amber
123-127 WIb*; op. dark palm green
128-132 WIb*; tsl. oyster white
133-135 WIb4; tsp. pale blue (opalescent)

There are five sizes (in millimetres):

A. L: 3.3-5.0 (3.9); D: 3.4-4.3 (3.9)
B. L: 3.7-5.5 (4.5); D: 3.8-4.8 (4.3)
C. L: 4.4-5.7 (5.0); D: 4.6-6.1 (5.3)
D. L: 5.2-6.7 (5.8); D: 5.2-7.1 (5.9)
E. L: 5.6-6.8 (6.4); D: 6.3-7.6 (7.0)

136-165 WIIIa and WIIIe; copper-covered glass beads; these come in eight shapes:

136-139 WIIIa*; round; four sizes (in millimetres):
A. L: 5.4-6.3 (5.8); D: 6.2-6.4 (6.3)
B. L: 7.1-7.8 (7.5); D: 7.4-7.6 (7.5)
C. L: 8.7-9.1 (8.9); D: 8.8-9.1 (9.0)
D. L: 9.5-10.1 (9.8); D: 9.9-10.1 (10.0)

140-143 WIIIa*; oval; four sizes (in millimetres):
A. L: 9.5-10.2 (9.9); D: 5.7-5.9 (5.8)
B. L: 10.3-11.2 (10.8); D: 6.3-6.9 (6.6)
C. L: 12.8-13.2 (13.0); D: 6.7-7.0 (6.9)
D. L: 13.4-14.3 (13.9); D: 7.8-8.3 (8.1)

144-148 WIIIe*; "five sided" (crudely shaped beads exhibiting ten pressed pentagonal facets); five sizes (in millimetres):
A. L: 6.6-7.6 (7.2); D: 5.7-6.4 (6.0)
B. L: 8.0-8.2 (8.1); D: 6.5-6.7 (6.6)
C. L: 8.4-10.0 (9.3); D: 7.1-7.2 (7.1)
D. L: 9.0-9.5 (9.3); D: 8.6-8.9 (8.8)
E. L: 11.1-11.3 (11.2); D: 10.6-10.7 (10.7)

149-150 WIIIe*; flattened teardrop (teardrop beads pressed flat parallel to the axis of the perforation); two sizes (in millimetres):
A. L: 10.3 (10.3); W: 7.9 (7.9); T: 5.8 (5.8)
B. L: 11.8-13.0 (12.4); W: 8.5-8.8 (8.7); T: indeterminate

151-154 WIIIe*; long square to hexagonal barrel (Beck's [1928] types IX.D.1.b., XII.D.1.b. and XIII.D.1.b., respectively; the pentagonal specimens predominate); four sizes (in millimetres):
A. L: 8.2-9.4 (8.9); D: 5.6-5.9 (5.7)
B. L: 10.5-11.7 (11.1); D: 6.7-7.2 (7.0)
C. L: 11.8-12.5 (12.2); D: 7.8-8.7 (8.3)
D. L: 13.3 (13.3); D: 9.1-9.4 (9.3)

155-157 WIIIe*; round-ribbed (a series of uneven, diagonal ribs covers each bead); three sizes (in millimetres):
A. L: 6.4-7.4 (6.8); D: 6.2-6.5 (6.3)
B. L: 7.3-9.1 (7.9); D: 6.5-7.2 (6.9)
C. L: 8.7-9.0 (8.8); D: 7.7-8.0 (7.8)

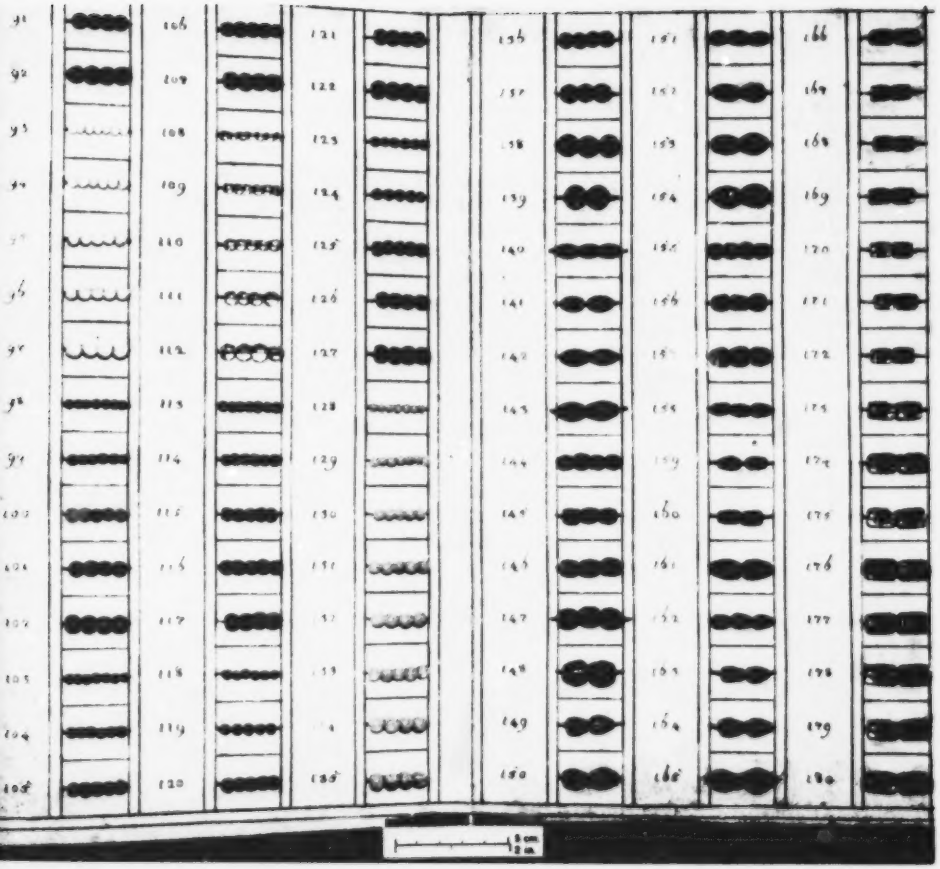

Figure 2. Bead book varieties 91-180. (Photo by Lester A. Ross)

158-161 WIIIe*; oval-ribbed; four sizes (in millimetres):
A. L: 9.4-9.5 (9.5); D: 5.3-5.5 (5.4)
B. L: 9.7-10.4 (10.1); D: 5.3-5.8 (5.6)
C. L: 9.8 (9.8); D: 5.6-6.0 (5.8)
D. L: 13.7 (13.7); D: 7.9 (7.9)

162-165 WIIIe*; teardrop-ribbed; four sizes in millimetres):
A. L: 9.3-9.9 (9.6); D: 5.9-6.0 (5.9)
B. L: 10.4-11.0 (10.7); D: 6.5 (6.5)
C. L: 11.5-11.6 (11.6); D: 7.2-7.6 (7.4)
D. L: 14.6-14.7 (14.7); D: 8.6-10.8 (9.7)

166-181 WIIIf; cylindrical beads with colourless bodies decorated internally with coloured cylindrical elements. The coloured glass occupies the central portion of each bead. The core elements come in eight colours:

166, 174 WIIIf*; tsp. rose wine
167, 175 WIIIf*; op. bright blue
168, 176 WIIIf*; op. black
169, 177 WIIIf*; tsp. dark jade green
170, 178 WIIIf*; tsp. scarlet
171, 179 WIIIf*; op. teal green
172-180 WIIIf*; tsp. bright navy and op. bright Dutch blue swirled together
173, 181 WIIIf*; tsp. amber

There are two sizes (in millimetres):
A. L: 8.6-11.9 (9.8); D: 5.6-7.5 (6.4)
B. L: 12.5-14.4 (13.4); D: 8.2-8.8 (8.4)

182-204 WIa and WIIIb; cylindrical beads with decorated and undecorated bodies; five varieties:

182-188 WIa*; tsl. oyster white
189-195 WIIIb*; swirled op. bright navy and op. bright Dutch blue decorated with several aventurine squiggles
196-197 WIa*; op. bright blue
198-199 WIa*; op. orchid mist
200-204 WIa*; tsp. pale blue (opalescent)

There are seven distinct sizes (in millimetres):
A. L: 8.0-9.8 (9.1); D: 5.1-5.7 (5.4)
B. L: 10.0-12.9 (10.8); D: 5.9-7.0 (5.6)
C. L: 10.7-13.8 (12.1); D: 6.3-7.7 (6.9)
D. L: 12.7-17.5 (15.2); D: 7.3-10.0 (8.5)
E. L: 14.5-19.5 (16.5); D: 8.5-10.2 (9.1)
F. L: 17.3-21.3 (19.3); D: 9.8-12.5 (11.2)
G. L: 20.4-22.5 (21.5); D: 12.8-13.0 (13.0)

205-225 WIb and WIIIb; round beads with decorated and undecorated bodies; four varieties:

205-210 WIb*; tsl. oyster white

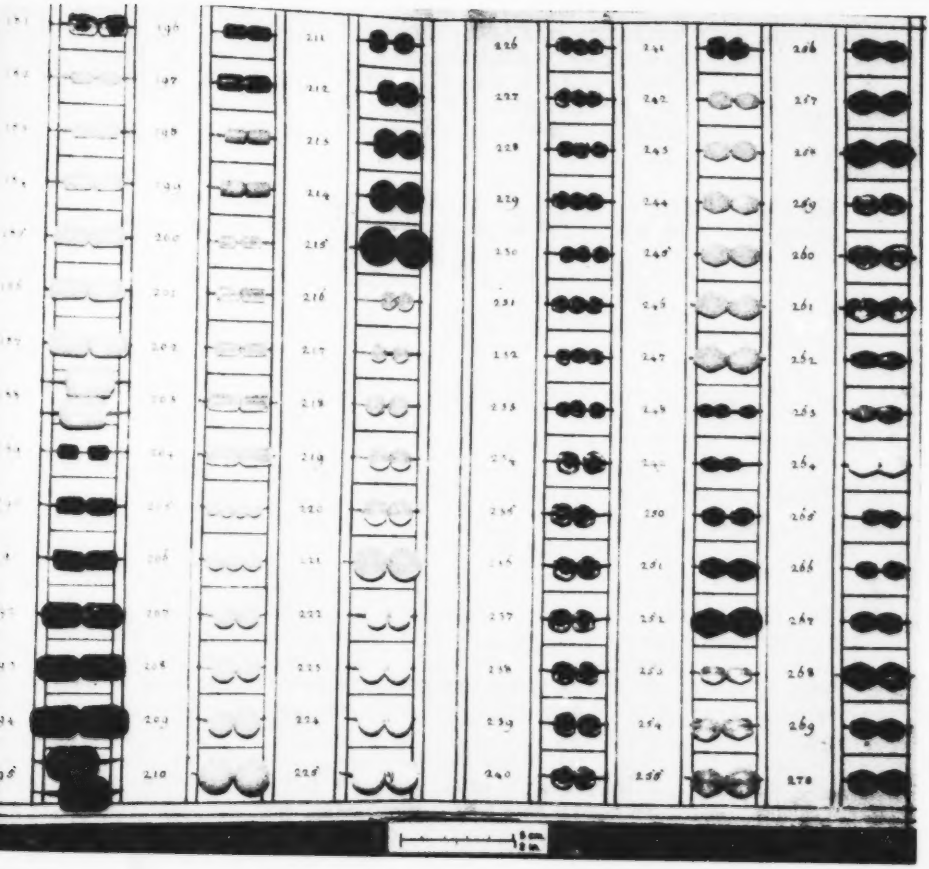

Figure 3. Bead book varieties 181-270. (Photo by Lester A. Ross)

211-215 WIIIb*; swirled op. bright navy and op. bright Dutch blue decorated with aventurine squiggles
216-221 WIb4; tsp. pale blue (opalescent)
222-225 WIb2; op. white

There are six size groups (in millimetres):
A. L: 5.8-7.0 (6.3); D: 7.0-8.6 (7.5)
B. L: 6.9-7.7 (7.5); D: 7.8-9.4 (8.5)
C. L: 8.3-9.6 (9.1); D: 9.4-10.8 (10.0)
D. L: 9.0-11.1 (10.1); D: 9.8-11.8 (10.9)
E. L: 10.4-11.7 (11.1); D: 11.3-12.8 (12.2)
F. L: 14.0-15.9 (14.8); D: 13.5-16.0 (14.7)

226-241 WIIIg; "five sided" beads of the same style as nos. 166-181: colourless bodies with a cylindrical coloured element at their core; the latter come in eight colours:

226, 234 WIIIg*; tsp. amber
227, 235 WIIIg*; op. black
228, 236 WIIIg*; op. teal green
229, 237 WIIIg*; tsp. rose wine
230, 238 WIIIg*; tsp. scarlet
231, 239 WIIIg*; tsp. bright navy and op. bright Dutch blue swirled together
232, 240 WIIIg*; op. bright blue
233, 241 WIIIg*; tsp. emerald green

There are two size groups (in millimetres):
A. L: 6.1-7.7 (6.8); D: 6.3-7.5 (6.8)
B. L: 8.7-10.1 (9.5); D: 9.0-10.0 (9.4)

242-270 WIIp and WIIIc; long square truncated convex bicone (Beck's [1928] type IX.D.1.f.) beads with decorated and undecorated bodies. The shape of these specimens is essentially that of two truncated pyramids joined together at their bases. The eight trapezoidal facets were formed with a small metal paddle while the glass was molten. There are ten varieties:

242-247 WIIp*; tsl. oyster white
248-252 WIIIc*; swirled op. bright navy and op. bright copen blue decorated with aventurine squiggles
253-255 WIIp*; tsp. (tending toward tsl. in the larger specimens) pale blue (opalescent)
256-258 WIIp*; tsp. scarlet
259-261 WIIp*; colourless; numerous bubbles in the glass
262 WIIp*; op. bright blue
263 WIIp*; orchid mist; the glass is swirled
262 WIIp*; op. white
265-268 WIIp*; tsp. terra cotta
269-270 WIIp*; tsp. emerald green

The oyster white specimens come in six sizes not readily identifiable to those of the others (in millimetres):
A. L: 10.6 (10.6); D: 7.5 (7.5)

B. L: 11.4 (11.4); D: 8.9-9.0 (9.0)
C. L: 12.0-12.4 (12.2); D: 8.9-9.3 (9.1)
D. L: 12.7-13.4 (13.1); D: 9.5-10.0 (9.8)
E. L: 15.0 (15.0); D: 10.7-11.5 (11.1)
F. L: 14.3-16.0 (15.2); D: 11.4-11.7 (11.6)

The other varieties represent five distinct size groups (in millimetres):

A. L: 6.4-7.3 (6.9); D: 5.3-5.5 (5.4)
B. L: 7.4-9.0 (8.2); D: 6.0-6.4 (6.2)
C. L: 8.7-12.3 (10.8); D: 6.6-9.0 (7.9)
D. L: 10.4-14.3 (12.6); D: 7.9-10.9 (9.3)
E. L: 12.1-16.0 (14.5); D: 9.1-12.6 (10.2)

271-274 WIIj; ovate-faceted beads decorated with 18-24 cut, trapezoidal to rectangular facets arranged in six to eight rows parallel to the axis and three rows perpendicular to it; two varieties:

271-272 WIIj*; tsp. pale blue (opalescent)
273-274 WIIj*; tsl. oyster white

Two size groups are represented. The smaller has 18-21 facets, whereas the larger has 21-24 (in millimetres):

A. L: 15.7-17.6 (16.9); D: 8.6-10.2 (9.4)
B. L: 18.8-19.5 (19.2); D: 11.0-12.3 (11.6)

275-277 WIIIc*; ovate-faceted beads with swirled op. bright navy and op. bright Dutch blue bodies containing aventurine squiggles. The specimens are covered with 15-21 cut facets: 10-14 pentagonals around the ends and 5-7 diamond-shaped ones around the middle. The beads come in three sizes (in millimetres):

A. L: 12.8-13.9 (13.4); D: 6.8-7.4 (7.1)
B. L: 17.5-17.9 (17.7); D: 8.1-8.5 (8.3)
C. L: 19.9-20.1 (20.0); D: 10.2-11.3 (10.8)

278-290 WIIf and WIIIc; "ridged tube" beads with monochrome and polychrome bodies. Depending on their size, these beads exhibit seven to ten, cut, rectangular facets which run the entire length of each specimen. Although the ends are rounded in most cases, those of nos. 282-283, 287-288 and 290 have been ground flat. Five varieties are shown:

278-279 WIIf*; tsp. terra cotta
280-283 WIIIc*; swirled op. bright navy and op. bright Dutch blue containing squiggles of aventurine
284-285 WIIf*; tsp. scarlet
286-288 WIIf*; tsp. pale blue (opalescent)
289-290 WIIf*; tsp. bright navy

The beads fall into four size categories (in millimetres):

A . 7-8 facets; L: 12.1-12.5 (12.3); D: 6.9-7.3 (7.1)
B. 7-9 facets; L: 14.2-16.6 (15.5); D: 8.0-8.7 (8.4)
C. 7-10 facets; L: 16.5-19.0 (17.9); D: 9.1-10.3 (9.8)
D. 8-9 facets; L: 19.2-20.8 (20.0); D: 10.2-11.5 (10.9)

291-300 WIIh and WIIIc; flattened teardrop beads with monochrome and polychrome bodies; six varieties:

291 WIIh*; tsp. scarlet
292-293 WIIh*; tsp. dark jade green
294-295 WIIh*; tsl. oyster white
296-297 WIIh*; tsp. ultramarine
298 WIIh*; op. black
299-300 WIIc*; swirled op. bright navy and op. bright Dutch blue containing aventurine squiggles

There are three size groups (in millimetres):

A. L: 10.5-12.1 (11.4); D: 7.9-9.6 (9.0); T: 6.5-7.5 (7.1)
B. L: 12.0-14.1 (12.7); D: 8.9-10.6 (9.7); T: 7.4-8.8 (8.0)
C. L: 14.4-15.4 (14.9); D: 11.4-11.9 (11.7); T: 9.4-9.5 (9.5)

301-322 WIIIa; undecorated "Cornaline d'Aleppo" beads having tsp. scarlet outer layers and op. white cores; three shapes:

301-311 WIIIa*; round; 11 sizes (in millimetres):
A. L: 3.0-3.7 (3.3); D: 3.9-4.2 (4.1)
B. L: 4.7-5.0 (4.8); D: 5.2-5.7 (5.4)
C. L: 5.2-5.5 (5.3); D: 6.3-6.5 (6.4)
D. L: 5.6-5.8 (5.7); D: 6.9-7.0 (7.0)
E. L: 6.7-6.8 (6.8); D: 7.3 (7.3)
F. L: 7.4 (7.4); D: 8.0-8.1 (8.1)
G. L: 8.4-8.9 (8.6); D: 8.9-9.2 (9.0)
H. L: 10.3-10.8 (10.6); D: 11.0-11.4 (11.2)
I. L: 11.1-11.6 (11.4); D: 11.7-12.0 (11.9)
J. L: 13.5-14.0 (13.8); D: 14.5-14.6 (14.6)
K. L: 16.0 (16.0); D: 17.0 (17.0)

312-315 WIIIa*; oval; four sizes (in millimetres):
A. L: 10.7-11.5 (11.1); D: 7.1-7.5 (7.3)
B. L: 14.1-14.6 (14.4); D: 8.8-9.0 (8.9)
C. L: 15.2-15.5 (15.4); D: 10.4-10.9 (10.7)
D. L: 19.1-20.3 (19.7); D: 12.1-12.6 (12.4)

316-322 WIIIa*; cylindrical; seven sizes (in millimetres):
A. L: 10.2 (10.2); D: 6.1-6.2 (6.2)
B. L: 11.3-11.8 (11.6); D: 7.2 (7.2)
C. L: 13.8-14.1 (14.0); D: 8.1-8.5 (8.3)
D. L: 14.5-14.7 (14.6); D: 8.7-9.2 (9.0)
E. L: 16.0-16.1 (16.1); D: 9.5-10.0 (9.8)
F. L: 18.2-18.5 (18.4); D: 12.0-12.2 (12.1)
G. L: 19.1-20.3 (19.7); D: 13.3-13.6 (13.5)

323-352 WIIIh; "Cornaline d'Aleppo" beads whose tsp. scarlet on op. white bodies are decorated with various inlaid design elements; ten varieties:

323-330 WIIIh*; round; op. black dots; eight sizes (in millimetres):
A. 9 dots; L: 4.5-4.9 (4.8); D: 5.2-5.6 (5.4)
B. 9 dots; L: 6.0-6.7 (6.4); D: 6.0-6.3 (6.2)
C. 9 dots; L: 6.6-7.2 (6.9); D: 7.0-7.4 (7.2)

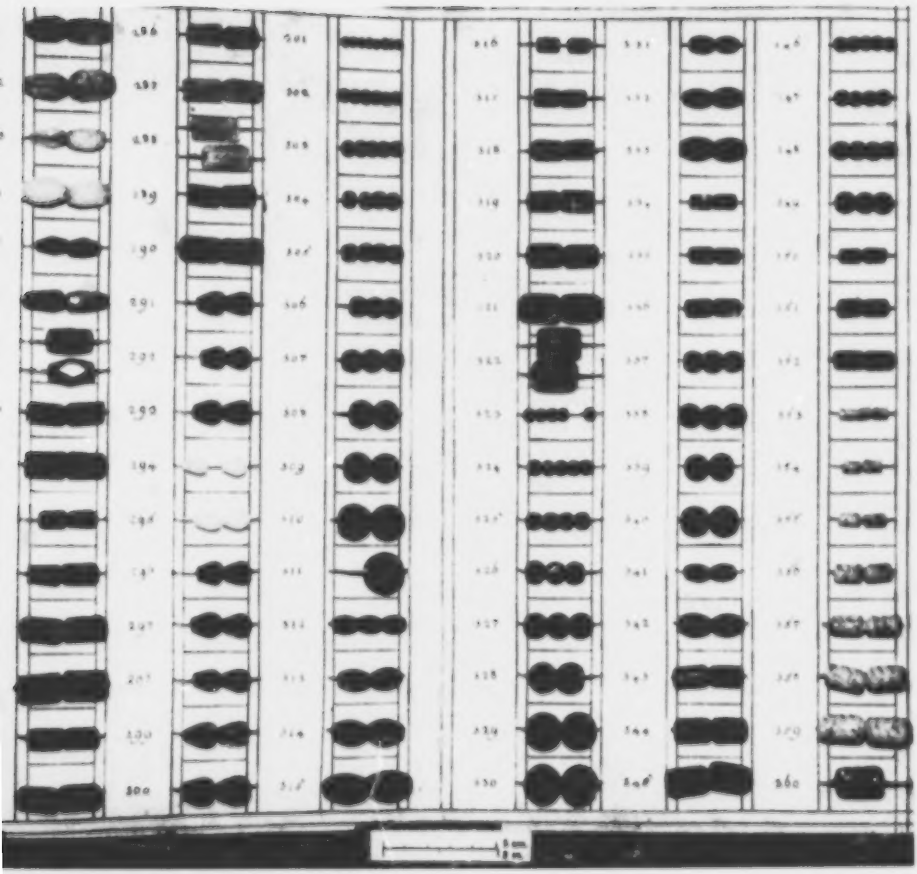

Figure 4. Bead book varieties 271-360. (Photo by Lester A. Ross)

D. 12 dots; L: 8.3-8.6 (8.5); D: 9.2-9.4 (9.3)
E. 12 dots; L: 9.4-9.6 (9.6); D: 10.3-10.5 (10.4)
F. 15 dots; L: 11.7-11.8 (11.8); D: 12.3-12.6 (12.5)
G. 25 dots; L: 14.2-14.3 (14.3); D: 15.2-15.3 (15.3)
H. 27 dots; L: 15.2-16.6 (15.9); D: 16.4-16.6 (16.5)

331-333 WIIIh*; oval; op. black dots; three sizes (in millimetres):
A. 12 dots; L: 10.5-11.1 (10.8); D: 7.0-7.2 (7.1)
B. 12 dots; L: 12.6-13.1 (12.9); D: 8.0-8.4 (8.2)
C. 20 dots; L: 14.6-14.7 (14.7); D: 9.8 (9.8)

334-336 WIIIh*; cylindrical; op. black dots; three sizes (in millimetres):
A. 9 dots; L: 10.2 (10.2); D: 6.0-6.1 (6.1)
B. 9 dots; L: 11.0-11.1 (11.1); D: 6.5-6.7 (6.6)
C. 16 dots; L: 12.0 (12.0); D: 7.2-7.5 (7.4)

337-339 WIIIh*; round; op. black on op. amber dots; three sizes (in millimetres):
A. 3 dots; L: 8.0-8.6 (8.3); D: 8.5-9.0 (8.7)
B. 4 dots; L: 9.3-9.6 (9.4); D: 9.8 (9.8)
C. 6 dots; L: 9.8-10.1 (10.0); D: 10.7-11.1 (10.9)

340 WIIIh*; round; op. amber on op. dark palm green dots; one size (in millimetres):
4 dots; L: 11.7 (11.7); D: 12.3-12.4 (12.4)

341-342 WIIIh*; oval; op. black on op. amber dots; two sizes (in millimetres):
A. 3 dots; L: 11.1-11.2 (11.2); D: 7.1-7.2 (7.2)
B. 4 dots; L: 14.1 (14.1); D: 9.3-9.8 (9.6)

343-344 WIIIh*; cylindrical; op. black on op. amber dots; two sizes (in millimetres):
A. 6 dots; L: 14.9-15.8 (15.4); D: 8.5-8.8 (8.7)
B. 9 dots: L: 15.3-16.2 (15.8); D: 10.0-10.3 (10.2)

345 WIIIh*; cylindrical; spiral stripe of aventurine on op. dark palm green; one size (in millimetres):
L: 18.3-18.7 (18.5); D: 11.3-11.6 (11.5)

346-349 WIIIh*; round; aventurine squiggles; four sizes (in millimetres):
A. L: 5.3-7.0 (5.7); D: 5.5-5.8 (5.7)
B. L: 5.9-6.3 (6.2); D: 6.1-6.4 (6.3)
C. L: 6.7-7.2 (7.0); D: 7.2-7.5 (7.4)
D. L: 8.0-8.5 (8.3); D: 8.4-8.8 (8.6)

350-352 WIIIh*; cylindrical; aventurine squiggles; three sizes (in millimetres):
A. L: 9.9-10.1 (10.0); D: 5.8-6.0 (5.9)
B. L: 11.0-11.3 (11.2); D: 7.0-7.4 (7.2)
C. L: 12.6-12.9 (12.8); D: 7.6-7.7 (7.7)

353-359 **WIIIb***; cylindrical tsl. oyster white beads decorated with tsp. bright navy squiggles; seven sizes (in millimetres):
A. L: 7.3-7.5 (7.4); D: 5.0 (5.0)
B. L: 8.6-9.1 (8.9); D: 5.3-5.6 (5.5)
C. L: 10.0-10.1 (10.1); D: 5.8-5.9 (5.9)

D. L: 12.5-12.7 (12.6); D: 7.8-7.9 (7.9)
E. L: 15.5-16.0 (15.8); D: 8.9-9.0 (9.0)
F. L: 17.6-18.3 (18.0); D: 10.4-10.7 (10.6)
G. L: 20.1-20.7 (20.4); D: 11.9-12.1 (12.0)

360 **WIIIb***; cylindrical "mosaic" bead with an op. black body decorated with three broad stripes composed of alternating bands of op. sunlight yellow and op. barn red, and scattered "star" cane inserts with four layers: 1) tsp. bright navy or tsp. emerald green outer layer, 2) op. white layer, 3) op. lilac layer, and 4) op. white core. One size is represented (in millimetres):
L: 21.0 (21.0); D: 12.1-12.9 (12.5)

361-367 **WIIIb**; round beads decorated with floral wreaths encircling their equators; seven varieties:
361 WIIIb*; tsp. scarlet; op. amber wreath
362 WIIIb*; op. white; tsp. ruby wreath
363 WIIIb*; op. white; tsp. bright navy wreath
364 WIIIb*; tsp. scarlet; op. white wreath
365 WIIIb*; tsp. bright navy; op. white wreath
366 WIIIb*; tsp. bright blue; op. white wreath
367 WIIIb*; tsp. emerald green; op. white wreath
The specimens all represent one size group (in millimetres):
L: 8.1-9.2 (8.6); D: 8.3-9.6 (8.2)

368-375 **WIIIb**; round beads decorated with three to four floral elements set parallel to the axis of the perforation; eight varieties:
368 WIIIb*; tsp. ruby; op. bright blue on op. white decoration
369 WIIIb*; op. black; op. white decoration
370 WIIIb*; op. bright blue; op. white decoration
371 WIIIb*; op. copen blue; op. amber decoration
372 WIIIb*; op. white; op. dark palm green decoration
373 WIIIb*; op. white; tsp. light gold decoration
374 WIIIb*; tsp. scarlet; op. white decoration
375 WIIIb*; tsp. emerald green; op. white decoration
The beads are all one size (in millimetres):
L: 9.1-10.6 (9.9); D: 8.2-9.8 (8.3)

376-380 **WIIIb**; round "eye" beads with tsl. light gray bodies decorated with compound dots; five varieties:
376 WIIIb; 15 eyes: 10 of op. amber on op. white, and 5 of op. bright blue on op. white
377 WIIIb; 12 eyes: 8 of tsp. dark palm green on op. white, and 4 of tsp. ruby on op. white
378 WIIIb; 15 eyes: 10 of tsp. bright navy on op. white, and 5 of op. amber on op. white
379 WIIIb; 15 eyes: 10 of tsp. bright navy on op. white, and 5 of tsp. ruby on op. white

380 WIIIb; 12 eyes: 8 of tsp. bright navy on op. white, and 4 of tsp. ruby on op. white

All of the specimens represent one size group (in millimetres):
L: 7.9-8.9 (8.5); D: 8.5-9.3 (8.9)

381-386 WIIIb; round "eye" beads with op. black bodies decorated with compound dots; six varieties:

381 WIIIb*; 9 eyes: 6 of op. bright blue on op. white, and 3 of tsp. ruby on op. white

382 WIIIb*; 12 eyes: 8 of op. bright blue on op. white, and 4 of tsp. ruby on op. white

383 WIIIb*; 15 eyes: 10 of op. bright blue on op. white, and 5 of tsp. ruby on op. white

384 WIIIb*; 25 eyes: 15 of tsp. turquoise green on op. white, and 10 of tsp. ruby on op. white

385 WIIIb*; 21 eyes: 14 of tsp. turquoise green on op. white, and 7 of tsp. ruby on op. white

386 WIIIb*; 12 eyes: all of tsp. bright navy on op. white

All six varieties seem to represent two size groups (in millimetres):
A. L: 8.0-9.5 (8.6); D: 8.3-9.5 (9.1)
B. L: 8.9-10.0 (9.5); D: 9.8-10.3 (10.1)

387-389 WIIIb; round "eye" beads with op. white bodies decorated with simple and compound dots; three varieties:

387 WIIIb*; 12 compound eyes of op. amber on tsp. bright navy

388 WIIIb*; 15 simple eyes: 10 of tsp. bright navy and 5 of tsp. ruby

389 WIIIb*; 15 simple eyes: 10 of tsp. emerald green and 5 of tsp. ruby

The beads all represent one size group (in millimetres):
L: 8.1-9.9 (8.7); D: 8.2-8.9 (8.5)

390 WIIIb*; round op. white bead decorated with a tsp. ruby stripe around the equator, and a tsp. bright navy corolla-like outline around either end; a tsp. light gold dot is situated in the centre of each of the eight "petals." One size group is represented (in millimetres):
L: 10.5-10.6 (10.6); D: 11.5 (11.5)

391-394 WIIIb; round "eye" beads with tsl. light gray bodies decorated with six to eight compound dots around the equator; four varieties:

391 WIIIb*; 6 eyes: 3 of tsp. bright navy on op. white, and 3 of tsp. ruby on op. white

392 WIIIb*; 8 eyes: 4 of tsp. dark palm green on op. white, and 4 of tsp. bright navy on op. white

393 WIIIb*; 6 eyes: 3 of tsp. dark palm green on op. white, and 3 of tsp. ruby on op. white

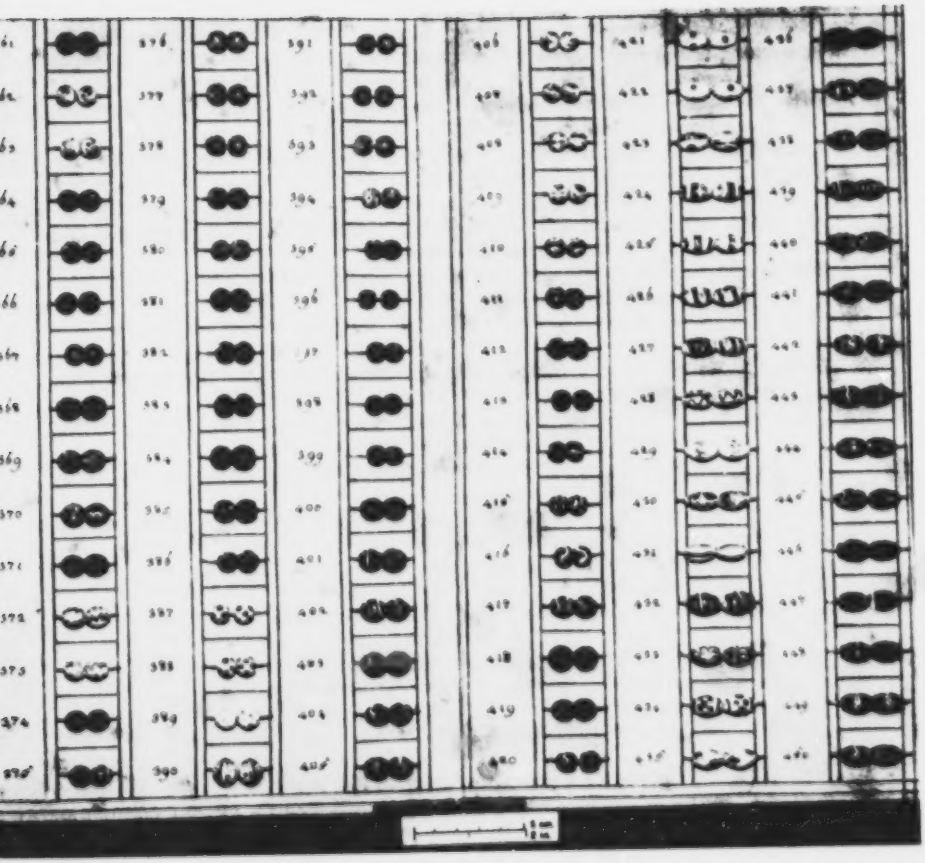

Figure 5. Bead book varieties 361-450. (Photo by Lester A. Ross)

394 WIIIb*; 8 eyes: 4 of tsp. dark palm green on op. white, and 4 of op. amber on op. white

One size group is represented (in millimetres)
L: 7.8-8.5 (8.2); D: 8.2-8.9 (8.6)

395-399 WIIIb; round "eye" beads with op. black bodies decorated with compound dots which encircle the equator; five varieties:

395 WIIIb*; 4 eyes of op. bright blue on op. white
396 WIIIb*; 4 eyes of op. bright blue on op. amber on op. white
397 WIIIb*; 6 eyes: 3 of op. amber on op. white, and 3 of tsp. bright navy on op. white
398 WIIIb*; 4 eyes of tsp. ruby on op. amber on op. white
399 WIIIb*; 6 eyes: 3 of tsp. ruby on op. white, and 3 of tsp. bright navy on op. white

The specimens represent one size group (in millimetres):
L: 7.2-8.2 (7.8); D: 7.7-8.4 (8.1)

400-405 WIIIb; round op. black beads decorated with dots and stripes; six varieties:

400 WIIIb*; 8-9 eyes of tsp. ruby on op. white, and a spiral stripe of aventurine
401 WIIIb*; 8-9 eyes of tsp. ruby on op. white, and a spiral stripe of op. white
402 WIIIb*; 7-9 eyes of op. bright blue on op. white, and a spiral stripe of op. white
403 WIIIb*; 8-11 dots of tsp. ruby on an op. white spiral stripe
404 WIIIb*; 6-7 eyes of tsp. ruby on op. white, and a wavy, spiral stripe of op. white
405 WIIIb*; 10 eyes of tsp. ruby on op. white, and wavy, spiral stripe of op. white around the equator

All of the specimens represent one size group (in millimetres):
L: 9.7-11.0 (10.3); D: 9.1-10.0 (9.4)

406-410 WIIIb; round op. white beads decorated with various elements; five varieties:

406 WIIIb*; 4 flowers with bilobate corollas of tsp. ruby and op. bright blue, and tsp. bright navy leaves; the stems of adjacent flowers point toward opposite bead ends
407 WIIIb*; 6 flowers with bilobate corollas of tsp. ruby, and op. dark palm green leaves; the stems of adjoining flowers point toward opposite bead ends
408 WIIIb*; 8 op. bright blue dots, and 4 straight stripes of tsp. ruby which parallel the perforation
409 WIIIb*; a floral wreath with alternating tsp. ruby and op. bright blue leaves girds the equator
410 WIIIb*; 3 op. amber floral elements, and 3 straight

stripes of tsp. ruby, each of which is adorned with 3 tsp. bright navy dots; all the elements are set parallel to the axis of the perforation

One size group is represented (in millimetres):
L: 8.1-9.0 (8.4); D: 7.7-8.3 (8.0)

411-420 WIIIb; round op. black beads decorated with various elements; ten varieties:

411 WIIIb*; a broad spiral stripe of op. white adorned with 13-21 alternating tsp. ruby and op. bright blue dots

412 WIIIb*; 4 op. amber and 4 op. bright blue dots alternating around the equator, and a wavy stripe of op. white around either end

413 WIIIb*; 4 straight stripes of tsp. ruby on op. white set parallel to the perforation, and 4 op. bright blue dots

414 WIIIb*; 5 straight stripes of op. bright blue on op. white set parallel to the axis, and 5 op. amber dots

415 WIIIb*; an op. white corolla-like outline with an op. amber dot in the centre of each of the five "petals" encircles either end

416 WIIIb*; 6 op. amber dots and a wavy op. white stripe encircle the equator

417 WIIIb*; 7-8 dots of op. amber, and a wavy, spiral stripe of op. white

418 WIIIb*; 4 op. amber dots around either end, and an op. white floral wreath around the equator

419 WIIIb*; 7 op. amber dots, and a wavy, spiral stripe of op. bright blue

420 WIIIb*; a wavy stripe of op. white girds the equator

The specimens apparently represent two size groups (in millimetres):
A. L: 7.4-10.0 (8.5); D: 7.7-9.2 (8.4)
B. L: 10.3-10.6 (10.5); D: 10.1-10.7 (10.4)

421-435 WIIIb; oval op. white beads decorated with various design elements; 15 varieties:

421 WIIIb*; 4 tsp. ruby dots around the equator

422 WIIIb*; 2 tsp. ruby dots and 2 op. medium turquoise blue dots which alternate about the equator

423 WIIIb*; 3 eyes of op. amber on op. bright blue, and 3 straight stripes of op. white on tsp. ruby which parallel the perforation; the eyes and stripes alternate about the bead

424 WIIIb*; an op. bright blue stripe adorned with 6 op. amber dots girds the equator, and a corolla-like outline of tsp. ruby with a tsp. bright navy dot in the centre of each of the four "petals" encircles either end

425 WIIIb*; a tsp. ruby stripe adorned with 8 op. white dots extends around the equator, and a wavy stripe of op. dark palm green encircles either end

426 WIIIb*; 8 op. bright blue dots, and a spiral stripe of tsp. ruby decorated with a wavy stripe of op. white

427 WIIIb*; an op. bright blue band, and a wavy spiral stripe of tsp. ruby

428 WIIIb*; 3 straight stripes of tsp. ruby and 3 wavy stripes of op. dark palm green set parallel to the perforation

429 WIIIb*; a floral wreath with alternating tsp. ruby and op. dark palm green leaf pairs encircles the middle

430 WIIIb*; 2 pairs of op. amber, op. bright blue and tsp. bright navy-petalled flowers with op. dark palm green leaves, and 2 compound stripes of wavy op. white on straight tsp. ruby; the stripes parallel the perforation

431 WIIIb*; 2 op. bright blue and 2 tsp. ruby straight stripes which parallel the perforation and alternate around the bead

432 WIIIb*; an op. bright blue spiral stripe, and a narrow, spiral floral wreath with alternating tsp. ruby and tsp. bright navy leaf pairs

433 WIIIb*; a combed design of alternating tsp. ruby and op. dark palm green

434 WIIIb*; 10 tsp. bright navy dots and 5 op. amber on op. bright blue eyes about the middle, and a tsp. ruby stripe around either end

435 WIIIb*; 3 flowers, each with 2 tsp. ruby petals and 2 op. bright blue leaves, encircle either end

One size group seems to be represented (in millimetres):
L: 12.5-15.8 (14.6); D: 7.3-10.0 (8.3)

436-465 WIIIb; oval op. black beads decorated with various design elements; 31 varieties:

436 WIIIb*; 8-9 eyes of tsp. ruby on op. white, and a spiral stripe of aventurine

437 WIIIb*; an op. white spiral stripe adorned with 9 tsp. ruby dots

438 WIIIb*; a spiral series of 8-9 eyes of tsp. ruby on op. amber on op. white, and an op. white spiral stripe

439 WIIIb*; a spiral series of 7-8 eyes of op. bright blue on op. white, and an op. white spiral stripe

440 WIIIb*; a spiral series of 7-9 eyes of tsp. bright navy on op. white, and an op. white spiral stripe

441 WIIIb*; 5 eyes of tsp. ruby on op. white around either end, and a stripe of tsp. bright navy on op. white around the equator

442, 443a WIIIb*; 4 eyes of tsp. ruby on op. white around either end, and a spiral op. white stripe around the middle

443b WIIIb*; a spiral series of 14 dots of alternating op. amber and op. bright blue, and a wavy stripe of tsp. ruby on a spiral op. white band

444 WIIIb*; a wavy, spiral stripe of op. amber, and a spiral stripe of op. white adorned with 16-17 dots of

alternating tsp. ruby and tsp. bright navy

445 WIIIb*; a spiral stripe of op. amber, and a wavy, spiral stripe of op. white

446 WIIIb*; a spiral band of op. bright blue, and a wavy, spiral stripe of op. white

447 WIIIb*; a stripe of op. amber on op. bright blue around the middle, and a wavy stripe of op. white about either end

448 WIIIb*; a tsp. ruby wavy stripe on an op. white band around the middle

449 WIIIb*; a medial band consisting of a wavy stripe of op. white on an op. bright blue band which is bordered on either side by an op. white stripe

450 WIIIb*; a wavy stripe of op. white on a band of op. amber girding the middle

451 WIIIb*; 5 eyes of tsp. emerald green on op. white around the equator

452 WIIIb*; 6 eyes of op. amber on tsp. ruby on op. white encircling the middle

453 WIIIb*; 12 eyes of op. black on op. amber

454 WIIIb*; a spiral series of 7 eyes of tsp. ruby on op. white, and a wavy, spiral stripe of op. white

455 WIIIb*; a spiral series of 7-9 dots of op. amber, and a wavy, spiral stripe of op. white

456 WIIIb*; a spiral series of 7-8 eyes of op. black on op. white and a wavy, spiral stripe of op. bright blue

457 WIIIb*; 4 flowers, each with an op. bright blue blossom with an op. black dot in the centre and a pair of op. white leaves, around either end

458 WIIIb*; a 2 x 4 grid composed of intersecting op. white stripes with an eye of tsp. ruby on op. white in each of the eight grid squares

459 WIIIb*; a wavy stripe of op. white around the middle

460 WIIIb*; a wavy stripe of op. white around the equator, and an op. white ring around either end

461 WIIIb*; a wavy, spiral stripe and a plain spiral stripe of op. white

462 WIIIb*; 4 wavy stripes of op. white set parallel to the perforation

463 WIIIb*; 4 floral wreaths of op. white set parallel to the perforation

464 WIIIb*; 2 stripes of tsp. ruby on op. white and 2 stripes of op. bright blue on op. white which alternate about the bead

465 WIIIb*; 4 stripes of tsp. ruby on op. white which parallel the perforation

All the specimens apparently represent one size group (in millimetres): L: 11.9-14.6 (13.2); D: 7.8-9.0 (8.5)

466-468 **WIIIb***; oval beads with swirled op. bright Dutch blue and op.

bright navy bodies decorated with several surficial squiggles of aventurine; three sizes (in millimetres):

A. L: 12.9-14.0 (13.5); D: 8.3-8.4 (8.4)
B. L: 15.0 (15.0); D: 9.5 (9.5)
C. L: 17.7-18.2 (18.0); D: 10.8-10.9 (10.9)

469-473 WIIIb; oval op. black beads decorated with various design elements; five varieties:

469 WIIIb*; a combed design of alternating op. white and aventurine
470 WIIIb*; a narrow, spiral floral wreath of op. white, and a spiral band of aventurine
471 WIIIb*; a spiral band of aventurine, and a spiral series of 35-41 eyes of alternating tsp. ruby on op. white and op. white on op. bright blue
472 WIIIb*; 12 dots of op. amber, 8 eyes of op. bright blue on op. white, and 4 eyes of tsp. ruby on op. white
473 WIIIb*; a spiral band of aventurine, and a spiral series of 39-42 dots of alternating op. white and op. bright blue

The specimens seem to represent one size group (in millimetres):
L: 15.6-17.4 (16.5); D: 9.8-12.4 (11.1)

474 WIIIb*; oval op. copen blue "eye" bead decorated with 25 compound dots of op. black on op. white; one size (in millimetres):
L: 15.9-16.2 (16.1); D: 9.2-9.8 (9.5)

475 WIIIb*; oval op. dark palm green bead decorated with a floral wreath of op. white around the equator, and a ring of aventurine around either end; one size (in millimetres):
L: 15.7-15.9 (15.8); D: 9.4-9.5 (9.5)

476-477 WIIIb; oval op. copen blue beads decorated with various design elements; two varieties:

476 WIIIb*; a band of aventurine on op. dark palm green superimposed upon a floral wreath of op. barn red about the middle
477 WIIIb*; a stripe of aventurine on op. dark palm green encircling the equator, and 3 eyes of op. barn red on op. amber around either end

Two size groups seem to be represented (in millimetres):
A. L: 12.4-12.6 (12.5); D: 8.0-8.1 (8.1)
B. L: 13.3-13.4 (13.4); D: 8.6-8.7 (8.7)

478a-b WIIIb; oval tsp. terra cotta "eye" beads decorated with compound dots; two varieties:

478a WIIIb*; 3 eyes of op. amber on tsp. ruby on op. white,

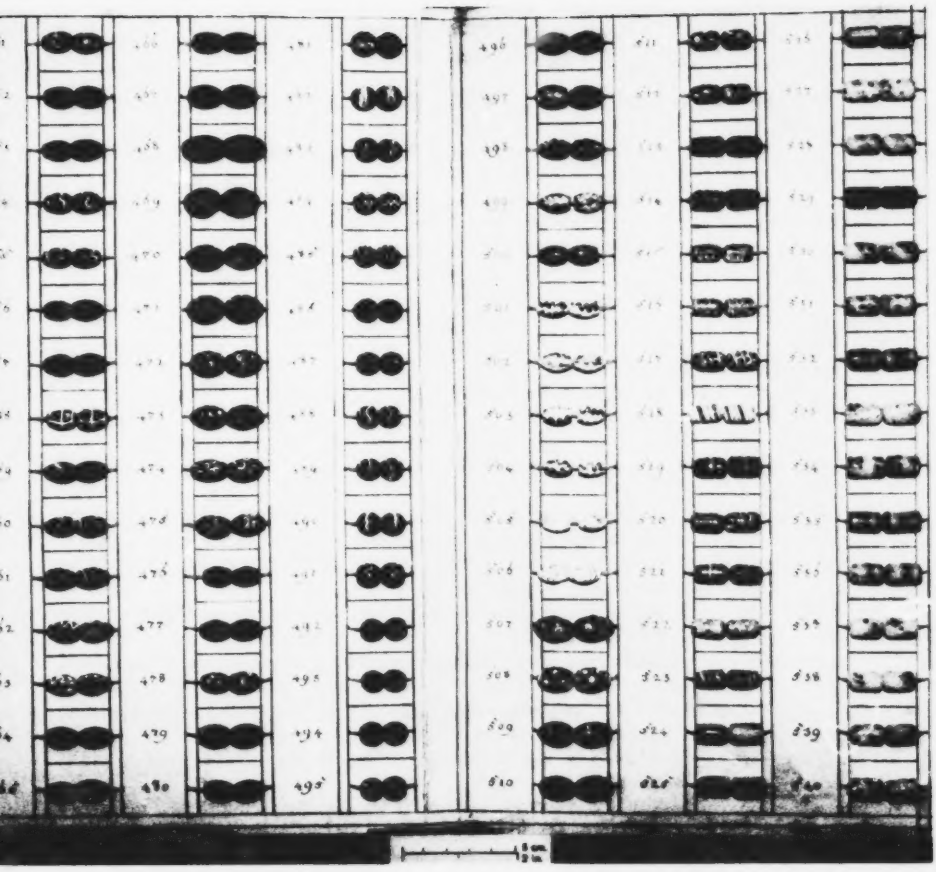

Figure 6. Bead book varieties 451-540. (Photo by Lester A. Ross)

each of which is surrounded by 5 smaller eyes of op. bright blue on op. white

478b WIIIb*; 3 eyes of op. amber on tsp. ruby on op. white, each of which is surrounded by 5-6 smaller eyes of op. barn red on op. white

One size (in millimetres):
L: 12.5-12.9 (12.7); D: 8.5-9.0 (8.8)

479-480 WIIIb; oval op. barn red beads decorated with spiral bands; two varieties:

479 WIIIb*; a spiral band of aventurine on op. dark palm green

480 WIIIb*; a wavy, spiral band of aventurine

One size group is represented (in millimetres):
L: 12.9-13.9 (13.4); D: 8.5-9.6 (9.0)

481 WIIIb*; round tsp. terra cotta beads decorated with 4 floral elements of tsp. ruby on op. white which are set parallel to the perforation; one size (in millimetres):
L: 10.3-10.7 (10.5); D: 10.1-10.4 (10.3)

482-491 WIIIb: round op. black beads decorated with various design elements; ten varieties:

482 WIIIb*; a wavy line of op. white on op. bright blue on an op. white band encircling the equator

483 WIIIb*; a wavy stripe of tsp. ruby on an op. white band around the equator

484 WIIIb*; 4 wavy lines of op. white set parallel to the perforation

485 WIIIb*; a wavy, spiral stripe and a plain, spiral stripe of op. white

486 WIIIb*; a wavy, spiral stripe of op. white, and a plain, spiral stripe of op. bright blue

487 WIIIb*; a wavy, spiral stripe of op. white, and a plain spiral of op. amber

488 WIIIb*; a wavy stripe of op. white around the equator, and an op. white ring around either end

489 WIIIb*; an op. white spiral stripe

490 WIIIb*; an op. white wavy stripe on an equatorial band of op. amber

491 WIIIb*; a floral wreath of op. white around the middle, and a ring of aventurine around either end

One size group is apparently represented (in millimetres):
L: 9.2-10.4 (10.0); D: 8.6-10.3 (9.4)

492-493 WIIIb; round op. copen blue beads decorated with various design elements; two varieties:

492 WIIIb*; a band of aventurine on op. dark palm green superimposed upon a floral wreath of op. barn red around the equator

493 WIIIb*; a stripe of aventurine on op. dark palm green encircling the equator, and 3 eyes of op. barn red on op. amber around either end

One size group is represented (in millimetres):
L: 9.5-9.7 (9.3); D: 8.6-8.9 (8.8)

494 WIIIb*; round op. barn red beads decorated with a spiral band of aventurine on op. dark palm green; one size (in millimetres):
L: 9.8-9.9 (9.9); D: 9.0-9.3 (9.2)

495 WIIIb*; round tsp. terra cotta "eye" beads decorated with 3 eyes of op. amber on tsp. ruby on op. white, each of which is surrounded by 6 smaller eyes of op. bright blue on op. white; one size (in millimetres):
L: 9.0-9.6 (9.3); D: 8.9-9.5 (9.2)

496-500 WIIIb; oval beads decorated with floral wreaths and other elements; five varieties:

496 WIIIb*; op. mustard gold body; a floral wreath of tsp. ruby around the equator, and an aventurine ring around either end

497 WIIIb*; tsp. terra cotta body; 4 wreaths of tsp. ruby on op. white set parallel to the perforation

498 WIIIb*; tsp. ruby body; 4 wreaths of op. bright blue on op. white which parallel the perforation

499 WIIIb*; op. bright blue body; 4 wreaths of op. white oriented parallel to the perforation

500 WIIIb*; op. copen blue body; 4 wreaths of op. amber which parallel the long axis

A single size group appears to be represented (in millimetres):
L: 12.6-14.8 (13.9); D: 8.2-9.8 (8.9)

501-506 WIIIb; oval beads with op. white bodies decorated with floral wreaths and other design elements; six varieties:

501 WIIIb*; 4 op. dark rose brown floral wreaths set parallel to the axis

502 WIIIb*; 2 tsp. ruby and 2 tsp. bright navy wreaths which parallel the axis

503 WIIIb*; 4 op. dark palm green wreaths laid parallel to the axis

504 WIIIb*; 4 tsp. bright navy wreaths that parallel the axis

505 WIIIb*; 4 tsp. light gold wreaths set parallel to the axis

506 WIIIb*; a tsp. ruby wreath encircling the middle, and an op. dark palm green ring around either end

A single size group seems to be represented (in millimetres):
L: 12.3-14.8 (13.3); D: 7.4-8.4 (8.0)

507-510 WIIIb; oval beads with op. black bodies decorated with various design elements; four varieties:

507 WIIIb*; an equatorial band of aventurine bordered on either side by a corolla-like outline of tsp. ruby on op. white with an eye of tsp. ruby on op. white in the centre of each petal, and 4 eyes of op. bright blue on op. white and an op. amber ring around either end

508 WIIIb*; 4 large and 4 small alternating dots of op. white encircling the equator, and 4 op. white floral elements superimposed upon an op. white wavy ring around either end

509 WIIIb*; an op. white and an op. amber spiral floral wreath

510 WIIIb*; 2 meandering floral wreaths: one of op. amber and the other of op. bright blue; the wreaths cross at four points, each of which is adorned with an eye of tsp. ruby on op. white

All the specimens represent one size group (in millimetres):
L: 15.6-17.8 (16.5); D: 9.6-10.7 (10.1)

511-523 WIIIb; cylindrical beads decorated with various design elements; 13 varieties:

511 WIIIb*; op. black body; 4 eyes of op. amber on op. white about the middle, and 4 eyes of op. bright blue on op. white around either end

512 WIIIb*; op. black body; 4 eyes of tsp. ruby on op. white around the middle, and 4 eyes of op. bright blue on op. white about either end

513 WIIIb*; tsp. scarlet body; a twisted, spiral band of op. light gold

514 WIIIb*; tsp. scarlet body; 2 spiral stripes: one of tsp. ruby on op. white, and the other of op. turquoise green on op. white

515 WIIIb*; tsp. light gray body; 2 spiral stripes: one of op. turquoise green and the other of op. amber

516 WIIIb*; tsp. light gray body; 2 spiral stripes: one of op. turquoise green, and the other of tsp. ruby on op. white

517 WIIIb*; tsp. terra cotta body; 2 spiral stripes: one of op. turquoise green on op. white, and the other of tsp. ruby on op. white, as well as 2 spiral series of 14-15 op. white dots each

518 WIIIb*; op. white body; 3 spiral stripes of op. turquoise green, op. light gold, and op. dark rose brown, respectively

519 WIIIb*; tsp. turquoise body; a stripe of op. light gold on op. white adorned with 8 op. copen blue dots encircling

the middle, and a ring of tsp. ruby on op. white around either end

520 WIIIb*; op. bright blue body; a spiral stripe of tsp. ruby on op. white, and a spiral series of short, diagonal dashes of alternating op. light gold and op. copen blue

521 WIIIb*; op. copen blue body; a ring of tsp. ruby on op. white around the middle with an op. bright blue ring adorned with 8 op. amber dots on either side of it

522 WIIIb*; op. aqua green body; 2 spiral stripes: one of tsp. ruby on op. white adorned with 12 op. white dots, and the other of copen blue with 12-13 op. white dots

523 WIIIb*; swirled op. bright navy and op. bright Dutch blue body; 2 spiral stripes: one of tsp. ruby on op. white, and the other of op. aqua green

One size group seems to be represented (in millimetres):
L: 12.3-15.6 (14.1); D: 7.0-8.4 (7.8)

524-540 WIIIb; cylindrical beads with tsl. light gray bodies decorated with various design elements; 17 varieties:

524 WIIIb*; 4 tsp. bright navy floral wreaths set parallel to the axis

525 WIIIb*; 2 tsp. bright navy and 2 tsp. ruby floral wreaths alternating about the bead

526 WIIIb*; 4 tsp. ruby wreaths set parallel to the axis

527 WIIIb*; an op. bright blue spiral wreath, and a spiral series of 7 eyes of tsp. ruby on op. white

528 WIIIb*; a spiral wreath of tsp. bright navy decorated with numerous, small op. amber dots, and a very pale tsp. turquoise wreath adorned with identical dots

529 WIIIb*; a spiral wreath of tsp. ruby, and a spiral stripe of tsp. bright navy

530 WIIIb*; a spiral wreath of op. bright blue and op. dark palm green adorned with 3 "blossoms" of op. amber on tsp. ruby on op. white

531 WIIIb*; an undulating ring of op. amber around either end, and 5 "double-stalked" flowers about the middle; each flower has a tsp. ruby on op. white blossom bounded at either end by a pair of tsp. bright navy on op. white eyes surmounting a pair of op. bright blue leaves

532 WIIIb*; 4 eyes of op. amber on op. barn red and 4 pairs of roughly crescent-shaped forms of op. amber on op. barn red with an op. barn red dot at either end of each crescent encircling the middle, and a tsp. ruby wreath around either end

533 WIIIb*; 2 flowers, each having 3 op. dark palm green basal leaves, and 6 op. bright blue "flower stalks" (2 on one side and 4 on the other) with a bell-shaped blossom of op. white and op. amber at the end of each; a small op. bright blue floral motif is situated between the bases of the flowers which are set parallel to the axis

534 WIIIb*; 4, 6-blossomed flowers with 2 basal leaves of op. dark palm green and op. bright blue "blossom stalks"; the blossoms of each flower consist of tsp. ruby on op. white, tsp. bright navy on op. amber, op. amber on tsp. bright navy, and op. amber on op. barn red, respectively

535 WIIIb*; a floral wreath of op. barn red about either end, and 2 pairs of flowers set parallel to the axis: the flowers of one pair have an op. bright blue stalk, a pair of dark palm green leaves, and a teardrop-shaped blossom of tsp. ruby on op. amber; those of the other have an op. bright blue stalk and a blossom with an op. amber centre and 4 tsp. bright navy petals; the stems of adjacent flowers point in opposite directions.

536 WIIIb*; 3 eyes of op. amber on tsp. bright navy around either end, and a floral wreath about the middle; the wreath is composed of ten pairs of leaves of alternating op. bright blue, and op. amber on tsp. bright navy

537 WIIIb*; 4 eyes of tsp. ruby on op. white around the middle, and a pair of flowers about either end; the flowers at one end each have a pair of basal leaves of op. bright blue and 3 conjoined blossoms of tsp. bright navy on op. amber; the flowers at the opposite end have the same colour leaves but the blossoms are of op. amber on tsp. bright navy

538 WIIIb*; 2 pairs of different flowers: one pair has 2 basal leaves of op. bright blue and a 3-blossom cluster of tsp. bright navy on op. amber; the other pair has the same colour leaves but the blossoms are of op. amber on tsp. bright navy; a flower of each type appears at either bead end

539 WIIIb*; 12 flowers, each having a pair of basal leaves of op. bright blue, and a single blossom of op. amber on tsp. bright navy; the flowers parallel the axis

540 WIIIb*; 12 flowers, each having a pair of basal leaves of op. bright blue and/or op. dark palm green, and a single blossom of tsp. ruby on op. white; the flowers are parallel to the axis

One size is apparently represented (in millimetres):
L: 13.9-16.9 (15.1); D: 8.2-9.2 (8.7)

541-555 WIIIb; round beads decorated with various design elements; 15 varieties:

541 WIIIb*; op. black body; 3 rings of op. white decorated with 6 tsp. ruby and 6 op. dark palm green dots

542 WIIIb*; op. black body; 5 rings of tsp. ruby on op. white decorated with 6 op. white dots

543 WIIIb*; op. white body; 4 floral motifs of op. dark rose brown with an eye of op. bright navy on op. white at the tip of each; set parallel to the axis, the stems of adjacent motifs point in opposite directions

544 WIIIb*; op. white body; a floral wreath of op. dark rose brown about the equator, and a crown-like decoration at either end; the latter adornment consists of a ring with a series of 8-10 dots along the outer edge

545 WIIIb*; op. white body; 6 floral motifs of op. aqua green edged with op. dark rose brown; set parallel to the axis, the motifs alternate in direction around the bead

546 WIIIb*; op. white body; 2 spiral stripes: one of alternating, diagonal dashes of tsp. bright navy and op. white, and the other of op. aqua green on op. white bordered with op. dark rose brown

547 WIIIb*; tsl. light gray body; 4 eyes of op. amber on op. dark rose brown on op. white encircling the equator, and 4 flowers around either end; set parallel to the axis, the flowers have 2 basal leaves of op. teal green on op. white and 3 ovate blossoms of op. amber on op. dark rose brown on op. white

548 WIIIb*; tsl. light gray body; an equatorial wreath composed of alternating pairs of op. teal green leaves and blossoms of op. white on tsp. ruby on op. white, and a crown-like design around either end; the latter decoration is composed of a ring of op. teal green on op. white with a series of eyes of op. white on tsp. ruby on op. white along the exterior edge

549 WIIIb*; tsl. light gray body; 4 dots of op. amber, op. dark rose brown and op. teal green swirled together on an op. white base around either end, and a complex wreath-like design encircling the equator; the latter decoration is composed of a series of loops of tsp. ruby on op. white with a swirl of op. aqua green on op. white in the centre of each; an oval of tsp. bright navy on op. white is situated at the junctures of the loops

550 WIIIb*; tsl. light gray body; 8 "double-stalked" flowers, each of which has an op. amber on tsp. ruby on op. white blossom bounded at either end by a tsp. bright navy on op. white element; the flowers parallel the axis

551 WIIIb*; tsl. light gray body; a meandering design composed of op. aqua green on op. white and tsp. ruby mixed with aventurine glass swirled together

552 WIIIb*; tsl. light gray body; a zigzagging wreath of op. dark rose brown on op. white encircling the equator with an eye of tsp. bright navy swirled together with op. white in each of the 8 angles

553 WIIIb*; tsl. light gray body; a "grape" design consisting of 4 pairs of op. teal green leaves and 4 triangular clusters of 6 op. bright navy on tsp. ruby on op. white "grapes"

554 WIIIb*; tsl. light gray body; 3 eyes of op. light gold on op. dark rose brown on op. white around the equator, and 3 flowers set parallel to the axis around either end; each flower has a pair of op. teal green leaves surmounted by

an ovate blossom of op. light gold on op. dark rose brown on op. white

555 WIIIb*; tsl. light gray body; a zigzagging, equatorial wreath of op. teal green on op. white with a flower in each of the 6 angles; each flower has a pair of op. light gold leaves and a tsp. ruby on op. white blossom

Several size groups seem to be represented but cannot be readily defined; taken as a whole, the specimens make up the following size group (in millimetres):

L: 10.7-17.0 (13.3); D: 10.8-16.4 (12.8)

556-561 WIIIa and WIIIe; gilded glass beads; these come in three shapes:

556-559 WIIIa*; round; four sizes in (millimetres):
A. L: 3.3-4.2 (3.8); D: 3.5-3.7 (3.6)
B. L: 5.1-5.7 (5.3); D: 5.0-5.2 (5.1)
C. L: 6.1-6.2 (6.2); D: 5.9-6.1 (6.0)
D. L: 7.0-7.3 (7.1); D: 7.1-7.4 (7.3)

560 WIIIa*; oval; one size (in millimetres):
L: 7.7-7.9 (7.8); D: 4.4-4.5 (4.4)

561 WIIIe*; teardrop; one size (in millimetres):
L: 15.1-15.4 (15.2); D: 8.5-8.6 (8.6)

562-568 WIIId and WIIIi; cylindrical beads decorated with various raised appliqués; 7 varieties:

562 WIIIi*; gilded body; a looped filament of tsp. emerald green bordered on either side by a gilded filament about the middle, and a looped thread of tsp. ruby around either end

563 WIIIi*; gilded body; 4 small ovals of alternating tsp. ruby and swirled op. bright blue and op. bright Dutch blue, each of which is enclosed by a gilded loop, encircling the middle; these appliqués are separated from each other by wavy gilded threads; a looped gilded filament encircles either end

564 WIIIi*; gilded op. white body; a medial band of tsp. light gray bordered on either side by a gilded looped filament, and 6 ovals of alternating tsp. ruby and op. bright blue encircled by gilded loops at either bead end

565 WIIId*; op. white body; a looped gilded filament about the middle, and 6 ovals of alternating tsp. ruby and op. bright blue encircled by gilded loops at either bead end

566 WIIId*; tsl. light gray body; a looped gilded filament around the middle, and 6 ovals of op. bright blue encircled by gilded loops around either bead end

567 WIIId*; op. black body; 6 small ovals of alternating tsp. ruby and op. bright blue, each of which is enclosed by a gilded loop, about the middle; a gilded looped filament borders either side of the aforementioned decoration and encircles either end

568 WIIIi*; "Cornaline d'Aleppo" body with a tsp. scarlet outer layer and an op. white core; 4 small ovals of op. bright blue set in gilded loops about the middle; a gilded looped thread borders either side of the aforementioned decoration and encircles either bead end

One size group seems to be represented (in millimetres):
L: 13.8-19.7 (17.3); D: 7.5-8.4 (8.0)

569-585 WIIId and WIIIi; round beads decorated with various raised appliqués; 14 varieties:

569 WIIId*; tsl. light gray body; an equatorial design composed of 8 globs of alternating tsp. ruby and tsp. emerald green set in gilded loops, and a looped gilded filament around either end

570 WIIId*; op. white body; 2 contiguous, rippled, spiral bands: one gilded and the other with a "satin silver" finish

571 WIIIi*; gilded body; a looped filament of op. bright blue bordered on either side by a looped gilded thread encircling the equator; a looped filament of tsp. ruby to either side of the aforementioned; and a gilded filament around either end

572 WIIIi*; gilded body; 8 globs of alternating tsp. ruby and op. bright blue set in gilded loops around the middle; a wavy filament of tsp. ruby to either side of the aforementioned; and a looped gilded filament about either bead end

573 WIIIi*; gilded body; 4 ovals of op. bright blue set in gilded loops alternating with 4 wavy filaments of tsp. ruby about the equator, and a looped gilded filament encircling either end

574 WIIIi*; gilded body; an equatorial wreath composed of alternating pairs of tsp. ruby and tsp. emerald green leaves; the wreath is surmounted by a gilded looped filament and bordered by a wavy gilded filament; a gilded looped thread encircles either bead end

575-577 Missing

578 WIIId*; tsl. light gray body; a looped filament of tsp. ruby bordered on either side by a gilded looped filament about the equator, and a gilded looped filament around the ends

579 WIIId*; tsl. light gray body; a looped filament of tsp. emerald green bordered on either side by a gilded looped filament around the equator, and a gilded looped thread about either end

580 WIIId*; op. bright blue body; a gilded wreath-like design around the equator, and a gilded looped filament around either end

581 WIIId*; op. copen blue body; decoration as for no. 580

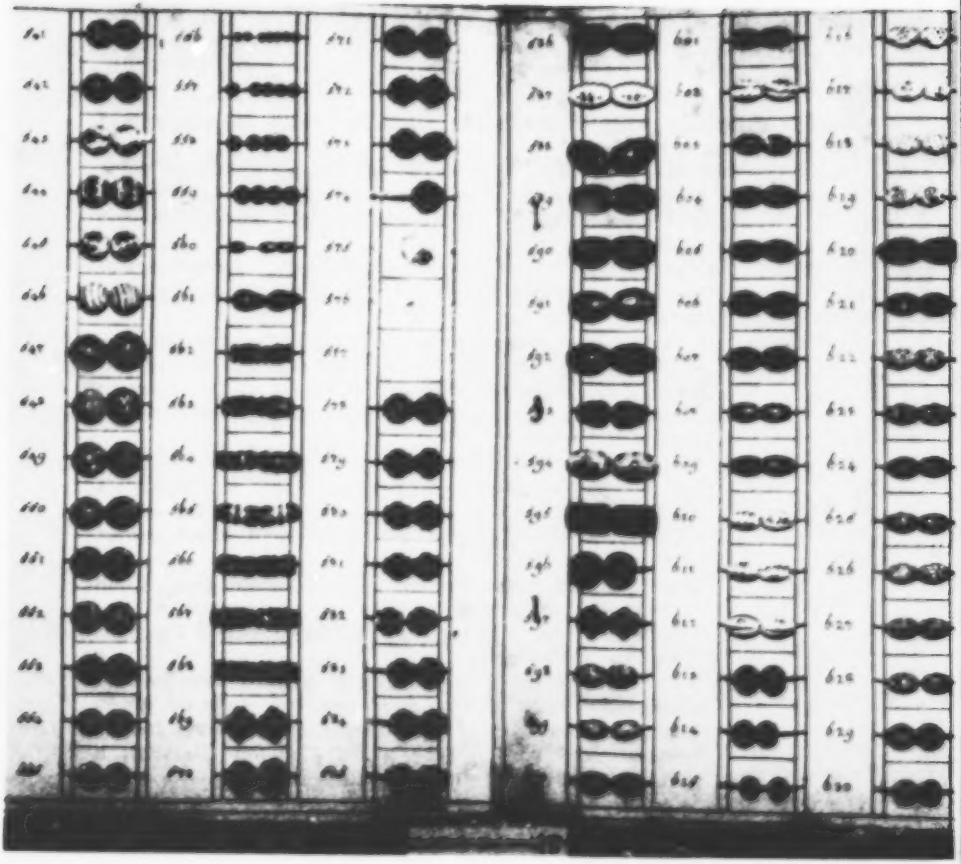

Figure 7. Bead book varieties 541-630. (Photo by Lester A. Ross)

582 WIIId*; swirled op. bright navy and op. bright Dutch blue body; decoration as for no. 580

583 WIIId*; op. dark palm green body; decoration as for no. 580

584 WIIIi*; "Cornaline d'Aleppo" body of tsp. scarlet on op. white; a looped filament of tsp. emerald green bordered on either side by a gilded looped filament about the equator, and a gilded looped filament about either end

585 WIIIi*; "Cornaline d'Aleppo" body of tsp. scarlet on op. white; decoration as for no. 584 except that the central looped filament is of op. bright blue

Several size groups seem to be represented but cannot be readily segregated; the specimens exhibit the following dimensions (in millimetres):

L: 11.9-14.3 (13.1); D: 10.5-14.3 (12.1)

586-596, 598-615 WIIId, WIIIi and WIIIj; beads of sundry shapes decorated with various painted gilt designs; 17 varieties:

586, 601 WIIId*; oval, swirled op. bright navy and op. bright Dutch blue body; 3 sets of 14 dots, 8 of which form a flower-like design while the rest form 2 pairs of "leaves"; the 3 groupings are separated from each other by a longitudinal stripe; two sizes (in millimetres):

A. L: 13.1-13.4 (13.2); D: 8.0-8.1 (8.0)
B. L: 18.0-18.7 (18.4); D: 11.5-11.8 (11.6)

587, 602, 611 WIIId*; oval, op. white body; 3 pairs of trilobate leaves and dots; each pair of leaves and dots is separated from the others by a wavy longitudinal stripe; three sizes (in millimetres):

A. L: 12.8-13.6 (13.2); D: 7.6-8.1 (7.8)
B. L: 14.7-14.9 (14.8); D: 8.9-9.1 (9.0)
C. L: 18.4-19.0 (18.7); D: 11.2-11.6 (11.4)

588, 603 WIIId*; oval, op. bright blue body; a conjoined series of 4 diamond-shaped outlines with a dot in the centre of each; two sizes (in millimetres):

A. L: 11.7-12.7 (12.2); D: 8.2-8.3 (8.2)
B. L: 20.0-20.3 (20.2); D: 12.5-13.0 (12.8)

589, 604, 606 WIIIi*; oval, "Cornaline d'Aleppo" body of tsp. ruby on op. white; 2 flower-like designs, each composed of four oval outlines, with a pair of curved lines extending from one design to the other; three sizes (in millimetres):

A. L: 13.1-13.7 (13.4); D: 8.2-8.5 (8.4)
A. L: 14.5-14.9 (14.7); D: 9.9-10.3 (10.1)
C. L: 18.0-18.3 (18.2); D: 11.4-12.0 (11.7)

590, 605 WIIId*; oval, op. black body; 4 diagonal, elongate sets of 8 dots and 4 diagonal stripes which alternate about the bead; two sizes (in millimetres):

A. L: 13.5-13.9 (13.7); D: 8.3-8.8 (8.6)
B. L: 18.0 (18.0); D: 12.5-13.0 (12.8)

591 WIIId*; oval, swirled op. orchid mist and op. light gold body; 6

wreaths set parallel to the axis; one size (in millimetres):
L: 18.1-18.7 (18.4); D: 12.7-13.1 (12.9)

592, 600 WIIId*; oval, op. bright blue body; 4 wreaths paralleling the perforation; each wreath has 3-4 outline leaves and 4-5 solid leaves; two sizes (in millimetres):
A. L: 13.8-14.0 (13.9); D: 9.1-9.4 (9.2)
B. L: 19.8-20.0 (19.9); D: 12.3-12.8 (12.6)

593 WIIIj*; flattened teardrop, swirled op. bright navy and op. bright Dutch blue body; 2 flowers and 2 longitudinal wreaths which alternate about the bead; one size (in millimetres):
L: 14.8-15.4 (15.1); D: 10.8-11.0 (10.9);
T: 9.3-10.0 (9.6)

594, 598, 599 WIIId*; oval, tsl. pale blue body (the glass has an orange hue when held up to a light); 2 flower-like designs, each composed of four oval outlines, which alternate about the bead with 2 linear designs composed of 2 circles with a dot between them; 2 sets of 3 dots decorate either bead end; three sizes (in millimetres):
A. L: 12.4-12.8 (12.6); D: 7.7 (7.7)
B. L: 13.7-14.0 (13.8); D: 9.1-9.3 (9.2)
C. L: 19.8-20.5 (20.2); D: 12.3-12.5 (12.4)

595 WIIIi*; cylindrical, "Cornaline d'Aleppo" body with a tsp. ruby outer layer and an op. white core; a floral design around the middle, and 6 dots; one size (in millimetres):
L: 19.8 (19.8); D: 11.7-11.9 (11.8)

596 WIIIi*; round, "Cornaline d'Aleppo" body as no. 595; 4 floral designs and 4 longitudinal stripes which alternate about the bead; one size (in millimetres):
L: 13.3-13.5 (13.4); D: 14.7-15.1 (14.9)

597 described after no. 614b

607, 609 WIIId*; oval, swirled op. bright navy and op. bright Dutch blue body; 4 floral wreaths laid parallel to the axis; the leaves on one side are outlined while those on the other are solid; two sizes (in millimetres):
A. L: 13.3-13.7 (13.5); D: 7.8-8.2 (8.0)
B. L: 14.8 (14.8); D: 9.6-10.1 (9.8)

608 WIIId*; oval, tsl. pale blue body (the glass has an orange hue when held up to the light); 4 floral wreaths set parallel to the axis; the leaves are the same style as nos. 607, 609; one size (in millimetres):
L: 13.4-13.6 (13.5); D: 7.8-8.0 (7.9)

610 WIIId*; oval, op. white body; 4 floral wreaths as for nos. 607, 609; one size (in millimetres):
L: 13.0-13.6 (13.3); D: 7.7-8.4 (8.0)

612 WIIId*; oval, op. white body; 4 gilt floral motifs, 2 longitudinal stripes of op. barn red and 2 of op. dark palm green which alternate about the bead; one size (in millimetres):
L: 14.6-14.8 (14.7); D: 9.6 (9.6)

613, 615 WIIId*; round, swirled op. bright navy and op. bright Dutch blue body; a floral design about the equator, and a ring around either end; two sizes (in millimetres):

A. L: 7.8-8.2 (8.0); D: 9.0-9.3 (9.2)
B. L: 10.4 (10.4); D: 11.8-12.0 (11.9)

614a WIIId*; round, tsl. light gray body; an equatorial series of 2 insect-like motifs, a star and a dot; one size (in millimetres):
L: 9.3 (9.3); D: 10.8 (10.8)

614b WIIId*; round, tsl. light gray body; a floral design encircling the equator, and 4 dots around either end; one size (in millimetres):
L: 9.6 (9.6); D: 10.5 (10.5)

597 WIIId*; round, swirled op. bright navy and op. bright Dutch blue body; 8 globs of tsp. ruby and tsl. light gray set in gilded loops which alternate about the equator, and a gilded looped filament about either end (in millimetres):
L: 13.4-13.6 (13.5); D: 12.4-13.8 (13.1)

616–628 WIIIb; oval beads decorated with various design elements; 13 varieties:

616 WIIIb*; op. white body; 3 flower-like arrangements of 7 turquoise green dots each encircling the middle, and 3 floral motifs of turquoise green around either end

617 WIIIb*; op. white body; 3 flowers about the equator, each with a pair of op. surf green basal leaves and a tsp. ruby blossom; a dot of tsl. pale blue is at the base of each flower and 3 more such dots encircle either end

618 WIIIb*; op. white body; a spiral floral wreath of op. light gold, and a spiral band composed of diagonal, alternating dashes of op. bright navy, op. white, and tsp. scarlet

619 WIIIb*; op. white body; a series of swirls of op. bright navy around the middle, and 3 dots of op. bright navy about either end

620 WIIIb*; op. black body; a combed design of op. white set parallel to the axis

621 WIIIb*; tsl. light gray body; a latticework of op. aqua green forming 20 square outlines with an eye of op. amber on op. bright navy in the centre of each

622 WIIIb*; op. white body; a latticework of op. light gold forming 20 square outlines with a dot of op. bright navy in the centre of each

623 WIIIb*; op. copen blue body; 3 rings of aventurine alternating with 2 floral wreaths of op. white

624 WIIIb*; tsl. light gray body; a latticework of op. light gold forming 20 square outlines with a dot of op. aqua green in the centre of each

625 WIIIb*; tsl. light gray body; a combed design of alternating op. bright navy on op. white and op. aqua green on op. white, and 3 eyes of op. amber on op. bright navy about either end

626 WIIIb*; tsl. light gray body; 3 tsp. ruby on op. white and

3 op. light gold on op. white floral designs set parallel to the axis which alternate about the bead

627 WIIIb*; tsl. light gray body; 3 longitudinal wreaths of op. bright navy on op. white alternating with 3 flowers, each having a blossom of tsp. ruby on op. white with a pair of basal petals of op. amber on op. white resting on a pair of basal leaves of op. surf green

628 WIIIb*; tsl. light gray body; 3 flowers encircling the middle, each having a blossom of op. bright navy on op. white with a pair of basal petals of tsp. ruby on op. white resting on a pair of basal leaves of op. surf green; the flowers are oriented perpendicular to the axis

Two size groups appear to be represented (in millimetres):
A. L: 12.1-14.2 (13.3); D: 7.8-9.2 (8.5)
B. L: 18.2-18.6 (18.4); D: 10.5-10.7 (10.6)

629-633 WIIIb; round beads decorated with various design elements; three varieties:

629 WIIIb*; op. light blue spruce body; swirls of op. teal green

630 WIIIb*; op. black body; 4 spiral floral wreaths; 2 of tsp. ruby on op. white and 2 of op. surf green on op. white

631-632 Missing

633 WIIIb*; op. white body; 4 spiral stripes of tsp. ruby alternating with 4 spiral stripes of tsp. dark green

Two size groups are represented (in millimetres):
A. L: 9.2-12.0 (10.8); D: 10.0-10.3 (10.2)
B. L: 16.2 (16.2); D: 22.2 (22.2)

634 Missing

635 Glass cabochon; tsp. ruby; plano-convex cross-section; multi-faceted: a star composed of 6 diamond-shaped facets in the centre, 12 rectanguloid facets along the perimeter, and 24 triangular facets in between; all the facets are cut; one size (in millimetres):
L: 26.1; W: 20.1; T: indeterminate

636-637 Round coral(?) bead fragment; tsl. coral; hardness is about 5 on Mohs' scale; dull surface; unmeasurable

638 WIIIa*; round "Cornaline d'Aleppo" bead of tsp. scarlet on op. white; this is a no. 311 bead which has recently been glued into this space; one size (in millimetres):
L: 16.9 (16.9); D: 18.0 (18.0)

639 Missing

640 Coral(?) cabochon; op. coral; hardness is about 3-4 on Mohs' scale; pocked but polished surface; the material is swirled or banded, and may be related to no. 636-637; one size (in millimetres):
L: 20.2; W: 17.8; T: indeterminate

641 Missing

642 Glass cabochon; tsp. scarlet; plano-convex cross-section; smooth, polished surface; one size (in millimetres):
L: 22.2; W: 18.5; T: indeterminate

643-645 WIb and WIIIb; round beads of assorted types; three varieties:
643 WIb*; tsl. copen blue body; undecorated
644 WIIIb*; tsp. emerald green body; a "spattered" design of op. amber on op. white
645 WIb*; op. redwood; undecorated
Three size groups are represented (in millimetres):
A. L: 11.1-11.5 (11.3); D: 12.0-12.1 (12.0)
B. L: 11.2-11.4 (11.3); D: 13.9-14.3 (14.1)
C. L: 13.0 (13.0); D: 15.5 (15.5)

646-658 IIIk and IIIn; drawn, tubular "chevron" beads with 5-6 ground facets on either end; 13 varieties:
646 IIIk*; round cross-section; 4 layers: (1) tsl. rose wine outer layer which appears black unless held up to a light; (2) op. white layer; (3) op. brick red layer; and (4) op. white core; the "rays" of layer 2 show through as whitish longitudinal stripes
647 IIIk*; round cross-section; 4 layers: (1) tsl. bright navy outer layer; (2) op. white layer; (3) op. brick red layer; and (4) op. white core
648 IIIk*; round cross-section; 4 layers: (1) tsp. dark green outer layer containing scattered aventurine; (2) op. white layer; (3) op. brick red layer; and (4) op. white core; the "rays" of layer 2 show through as whitish stripes
649 IIIk*; round cross-section; 4 layers: (1) tsl. bright navy outer layer which appears black unless held up to a light; (2) op. light gold layer; (3) op. brick red layer; and (4) op. light gold core
650 IIIk*; hexagonal cross-section; 2 layers: (1) op. black outer layer; and (2) op. brick red core
651 IIIn*; round cross-section; 4 layers: (1) tsp. dark green outer layer decorated with 6 straight stripes of op. brick red on op. light gold; (2) op. white layer; (3) op. brick

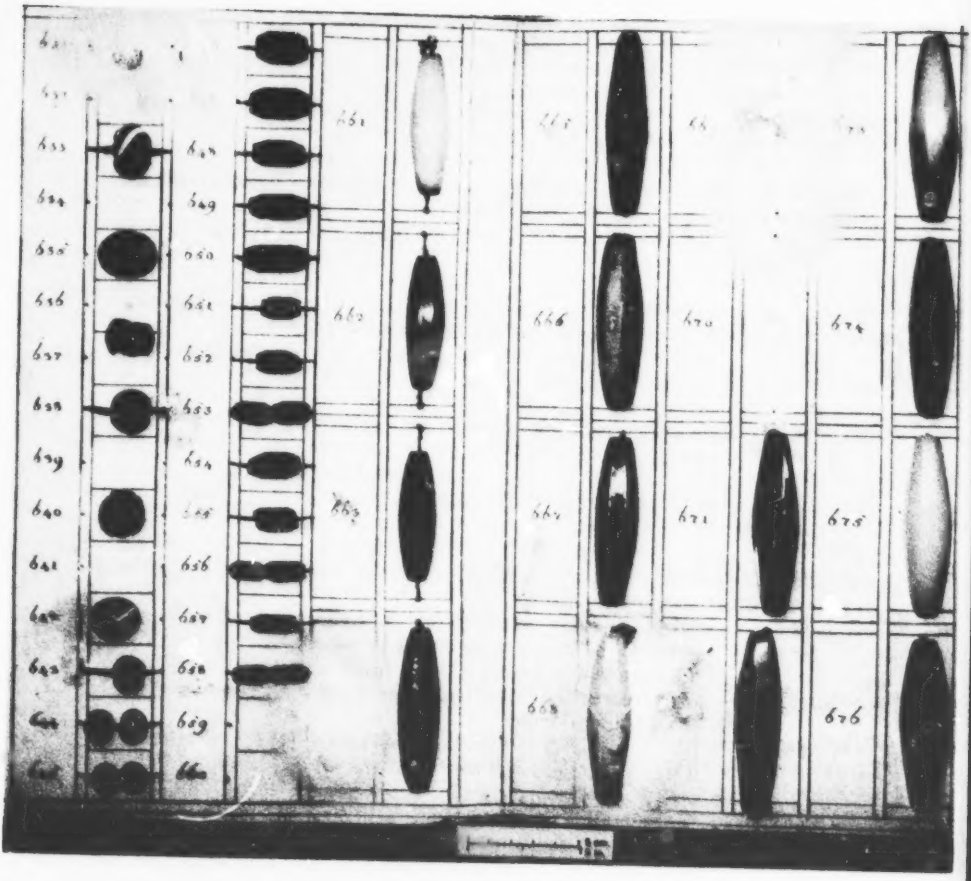

Figure 8. Bead book varieties 631-676. (Photo by Lester A. Ross)

red layer; and (4) op. white core; the "rays" of layer 2 show through as whitish longitudinal stripes

652 IIIn*; round cross-section; 4 layers: (1) tsl. bright navy outer layer decorated with 6 straight stripes of op. brick red on op. light gold; (2) op. white layer; (3) op. brick red layer; and (4) op. white core; the "rays" of layer 2 show through as whitish stripes

653 IIIk*; round cross-section; 4 layers: (1) op. brick red outer layer; (2) tsl. light gray layer; (3) op. brick red layer; and (4) tsl. light gray core

654 IIIk*; hexagonal cross-section (the facets have longitudinally concave surfaces); 3 layers: (1) op. black outer layer; (2) op. brick red layer; and (3) op. white core

655 IIIn*; round cross-section; 4 layers: (1) op. brick red outer layer decorated with 6 tsl. light gray stripes; (2) tsl. light gray layer; (3) op. brick red layer; and (4) tsl. light gray core

656 IIIk*; round cross-section; 4 layers: (1) tsl. rose wine outer layer which appears black unless held up to a light; (2) op. white layer; (3) op. brick red layer; and (4) op. white core

657 IIIk*; round cross-section; 4 layers: (1) tsl. bright navy outer layer; (2) op. white layer; (3) op. brick red layer; and (4) op. white core; the "rays" of layer 2 show through as longitudinal whitish stripes

658 IIIk*; hexagonal cross-section; 4 layers: (1) op. brick red outer layer; (2) tsl. light gray layer; (3) op. brick red layer; and (4) tsl. light gray core

The round-sectioned beads seem to represent four size groups (in millimetres):

A. L: 15.0-22.1 (18.5); D: 6.8-7.7 (7.2)
B. L: 17.1-20.2 (18.6); D: 8.5-9.6 (9.1)
C. L: 24.1-26.0 (25.0); D: 10.0-10.4 (10.2)
D. L: 22.7-26.2 (24.4); D: 12.5-12.7 (12.6)

The hexagonal specimens apparently represent two size groups (in millimetres):

A. L: 15.5-18.0 (16.8); D: 6.2-6.8 (6.5)
B. L: 23.2-29.0 (26.1); D: 9.1-9.7 (9.4)

659-660 Missing

661-676 MPIIc and MPIVa; mould-pressed, monochrome and polychrome, long octagonal barrel beads. Corresponding to Beck's (1928) type XIV.D.1.b., these beads have octagonal-sectioned bodies which taper toward either end; each of the 8 facets has been ground smooth; 11 varieties:

661 MPIIc*; tsl. light gray body; undecorate

662, 672 MPIVa*; swirled op. bright navy and op. copen blue body containing streaks of aventurine; undecorated

663, 664, 666 MPIVa*; swirled op. bright navy and op. copen blue body containing streaks of aventurine; decorated with 4, painted, longitudinal, gilt floral wreaths and 4 painted sets of 3 small gilt floral designs which alternate about the bead

665 MPIVa*; swirled op. bright navy and op. copen blue body; undecorated

667 MPIVa*; op. black body containing streaks of aventurine; decorated with painted gilt floral wreaths along the ridges at the juncture of adjoining facets

668 MPIIc*; tsl. pale blue body; the glass has a distinct orange hue; undecorated

669-670 Missing

671 MPIVa*; tsl. rose wine body containing streaks of op. white; the body appears black unless held up to a light; undecorated

673 MPIVa*; tsl. light gray body containing streaks of tsl. coral; undecorated

674 MPIVa*; tsl. barn red body containing numerous tiny inclusions of op. white; undecorated

675 MPIIc*; tsl. light gray body; undecorated

676 MPIVa*; op. black body containing streaks of aventurine; undecorated

Three size groups appear to be represented (in millimetres):

A. L: 54.9-57.3 (56.1); D: 16.5-16.8 (16.6)

B. L: 60.1-69.5 (64.8); D: 17.4-17.6 (17.5)

C. L: 71.5-80.0 (76.1); D: 18.5-20.4 (19.6)

Discussion and Conclusions

The Venetian Bead Book evidently formed part of a collection of Venetian glass accumulated by Felix Slade before his death in 1868. A catalogue of the collection published in 1871 describes a "Box or book, containing patterns of beads numbered up to 676, but of which a few are missing. This book was found in India wth a quantity of beads, and had evidently been sent out for the use of some trader. Height 15 1/2 in. Width 9 in." (Frankf 1871: 163, no. 944). Because the collection was donated to the British Museum after Slade's death and the dimensions of the Slade book and the number of bead varieties involved are identical to those of the book held by the Museum of Mankind, the two bead books are doubtless one and the same.

The only other information concerning the Venetian Bead Book appears on an affixed label which reads "According to H.J. Braunholtz, this book had a label saying that the beads were Venetian, 1704, [signed] F.A. Carey 22.10.1959." Furthermore, aside from the variety numbers scribed on its pages, there is no writing on or in the book, making it impossible to determine its exact date and place of origin. An approximate date range and probable country of origin can be ascertained on the basis of the beads themselves.

Although many of the bead book specimens, such as the eye, combed and chevron beads, have stylistic counterparts in earlier centuries, the collection taken as a whole is definitely a 19th century manifestation. This is evinced by the fact that the "fancy," often gaudy, beads that predominate in the book only began to be made in the early part of the 19th century (Woodward 1970: 20). The red-on-white Cornaline d'Aleppo specimens of wound manufacture apparently made their debut at about the same time (Harris and Harris 1967: 153 [no. 154], 158; van der Sleen 1967: 84-85).

Comparing the bead book with several archaeological collections of early 19th century beads, three sets of mid- to late 19th century sample cards and books, and two early 20th century bead catalogues, the greatest number of correlatives occur in the sample cards and books: The Levin Catalogue (1851-69) in the Museum of Mankind, London; the Dan Frost collection of trade beads (1848-1904) at the Illinois State Museum, Springfield; and, especially, the Giacomuzzi book and sample cards of Venetian beads (ca. 1852-ca. 1898) at The Bead Museum, Prescott, Arizona. This suggests the London bead book is coeval with these three collections.

Regarding origin, the fancy overlaid and inlaid beads that make up the bulk of the book were most likely produced in Venice, the renowned manufacturing centre for these types, and the other specimens were probably made there as well. The only possible exceptions are the long, octagonal barrel beads of mould-pressed manufacture that appear on the last two pages of the book. Although similar specimens are described as "Venetian" in one of the 20th century catalogues (Liu 1975: 32), several also appear on two sample cards from Gablonz in the Frost collection. It is, therefore, possible that both Venetian and Bohemian beads are present in the book, though likely they are all of Venetian origin.

Regarding the book itself, experts at the British Library, London, found its binding rather crude and declared it unlikely to be of Venetian manufacture (B.J. Mack 1976: pers. com.). However, the construction and layout of the London book's pages are nearly identical to those of the Giacomuzzi book, strongly suggesting the former is of Venetian origin as well (Karklins 1984: 6-7).

To obtain comparative trace element data for future research, tiny fragments that had broken from two of the sample book specimens were submitted for neutron activation analysis (Table 2). One of the specimens was a 19-mg piece of the black body of bead no. 508. The other was a 5.2-mg fragment of the transparent ruby filament that adorned bead no. 562. Both samples were analysed by instrumental neutron activation analysis at the SLOWPOKE reactor facility of the University of Toronto. The samples were irradiated at two different times: a short irradiation for 6 minutes at a flux of 1.0 x 1012 n/cm2.s for the red glass and a flux of 2.5 x 1011 n/cm2.s for the black glass, followed by a 16-hour irradiation at a flux of 2.5 x 1011 n/cm2.s for both glasses. After irradiation the samples were assayed with a lithium drifted germanium detector coupled to a Canberra 8180 multichannel analyser. Because of sample positioning errors due to the small sample size, replicate analyses were necessary.

Atomic absorption analysis of the two bead fragments revealed that both were composed of lead glass. The ruby specimen (no. 503) contained 24.8±1% lead oxide (PbO) and the black specimen contained 19.4±1% lead oxide (John Stewart, Conservation Division, Parks Canada, 1985: pers. com.).

Table 2. Neutron activation analysis of sample book specimens nos. 508 and 562 (values expressed in parts per million except where shown in per cent).

Elements	Bead no. 508** (black glass)	Bead no. 562** (ruby glass)
Co	110±10	* 7
U	36±6	7.5±0.4
Dy	* 13	* 0.8
Eu	* 1.9	* 1.1
Ba	* 5000	* 240
Ti	* 3600	* 200
Sm	* 5400	* 370
Sr*	* 8900	* 700
Au	* 0.23	170±10
I	* 170	* 7.9
As	1.7±0.1%	3.6±0.1%
Sb	140±20	450±50
Br	* 17	* 13
Ag	* 1100	* 33
Mg	* 2.5%	* 3200
Cu	* 1300	* 90
Na	7.7±0.4%	1.00±0.05%
V	* 17	* 8
K	* 0.72%	15.0±0.5%
Al	5100±200	2.1±0.1%
Mn	3.6±0.1%	110±10
Cl	9400±960	8000±200
Ca	3.0±0.5%	8400±700
Sm	* 0.43	* 1.8
Yb	* 7.9	* 28
La	* 8.9	* 30
Nd	* 35	* 150
Ce	* 10	* 56
Lu	* 0.23	* 1.1
Th	* 1.2	* 4.3
Cr	* 22	* 70
Hf	* 2.0	* 6.3
Cs	* 2.6	* 9.3
Ni	* 330	* 1000
Tb	* 0.50	* 1.0
Sc	0.70±10	* 0.26
Rb	* 11	* 190
Fe	4700±700	* 3200
Zn	470±40	* 170
Ta	* 2	* 8

** These two columns of data do not match their headings in the 1st edition (*History and Archaeology* 59).

± Standard deviation.

* Element not detected (the amount would have had to be equal to or greater than that shown).

Appendix A. Bead Book Type Index

Type	Bead Numbers
IIIk	646-650; 653-654; 656-658
IIIn	651-652; 655
WIa	182-188; 196-204
WIb	88-135; 205-210; 216-225; 643; 645
WIc	48-87
WIIf	278-279; 284-290
WIIh	291-298
WIIj	271-274
WIIm	1-45
WIIo	1-47
WIIp	242-247; 253-270
WIIIa	136-143; 301-322; 556-560; 638
WIIIb	189-195; 211-215; 353-555; 616-633; 644
WIIIc	248-252; 275-277; 280-283; 299-300
WIIId	565-567; 569-570; 578-583; 586-588; 590-592; 594; 597-603; 605; 607-615
WIIIe	144-165; 561
WIIIf	166-181
WIIIg	226-241
WIIIh	323-352
WIIIi	562-564; 568; 571-574; 584-585; 589; 595-596; 604; 606
WIIIj	593
MPIIc	661; 668; 675
MPIVa	662-667; 671-674; 676

GUIDE TO THE DESCRIPTION AND CLASSIFICATION OF GLASS BEADS

Abstract

This guide provides information relevant to the classification of glass beads recovered from archaeological sites in Canada. It is partly based on and intended to be used with "A Classification System for Glass Beads for the use of Field Archaeologists," by Kenneth and Martha Kidd. Material presented includes a critical evaluation of several bead classification schemes, an overview of bead-manufacturing techniques, a descriptive listing of the various classes and types of beads that have been recorded to date, an explication of the physical attributes of a bead and some interpretative material. Information relevant to entering glass beads in the Parks Canada artifact data base system is also provided.

Introduction

During the past six decades, several systems have been proposed for the classification of glass beads. Although the majority are elementary in nature and have limited application, four are noteworthy.

The first classificatory scheme for beads was published in 1928 by Horace C. Beck. Comprehensive though it was, his "Classification and Nomenclature of Beads and Pendants" was aimed primarily at Old War researchers and never achieved popularity in North America. Nevertheless, Beck's work remains a valuable research tool and is a classic in its own right.

Little progress was made during the next two decades. Then, in the 1950s, Kenneth E. Kidd formulated a scheme which, with modifications and the collaboration of his wife Martha, was published in 1970 as "A Classification System for Glass Beads for the Use of Field Archaeologists." Utilizing primarily the process of manufacture to sort beads and secondarily the physical attributes, the system is most notable for its extensive colour plates illustrating each recorded bead type. Also noteworthy is the extremely well-developed typological flow chart for drawn beads (Kidd and Kidd 1970: 51). Unfortunately, the wound-bead chart (Kidd and Kidd 1970: 52) is not nearly as detailed, and wound-on-drawn, mould-pressed, blown and moulded beads are not dealt with at all. Furthermore, many of the bead classes and some of the terms are not adequately defined, making the system difficult to use at times. Another drawback centres on the fact that the system, developed using beads derived from early historical period sites in the Northeast, has been found to be of little utility by several researchers in the Pacific Northwest (Ross 1976: 671-73; Sprague 1971: 128-29). In its favour is the fact that it is an open-ended system so that new categories, classes, types and varieties can be added as they are required.

In the same year that the previous report was published, Lyle M. Stone completed his treatise on Fort Michilimackinac. Published four years later, it contains a section on beads wherein the primary sorting is based on function as revealed by relative size. The two pertinent functional categories (necklace beads and seed beads) are each further subdivided into Class (method of manufacture), Series (structure or form), Type (shape), and Variety (colour and diaphaneity). All of the varieties are illustrated in colour photographs.

The main drawback to Stone's approach is that relative size and function do not always equate; not all "large" beads found their use in necklaces and not all "small" beads are seed beads (the latter should have been designated "embroidery beads" as the term "seed bead" is a size designation). There is also the problematic "medium" size group which overlaps both categories. Secondarily, this system, like the previous one, deals only with drawn and wound beads and has not found acceptance on the West Coast.

The final classification system to be dealt with herein appeared in 1976. In that year, Lester A. Ross completed his monograph "Fort Vancouver, 1829-1860: A Historical Archeological Investigation of the Goods Imported and Manufactured by the Hudson's Bay Company" which

contains a lengthy and well-illustrated section on glass beads. The specimens are classified using a typological scheme reminiscent of and apparently lightly influenced by that of Kenneth and Martha Kidd (1970). However, the Fort Vancouver typology is much more comprehensive, covering all the major manufacturing types. It is also not as rigid a system as that of the Kidds and there is no coding of the various bead types. Although this allows every minor variant to be recorded, it does little to facilitate the inter-site comparison of bead assemblages. Notwithstanding, Ross's scheme is a milestone for a part of the continent where the typical classification "system" has for so long consisted of a loosely ordered list of inadequately described bead types.

Although each of the foregoing systems has its drawbacks, the one that seems to offer the most potential and appears to have found the most universal acceptance is the one devised by Kenneth and Martha Kidd (1970). Consequently, it has been chosen to form the basis for this guide.

The typology for drawn and wound beads that follows is a corrected and expanded version of that proposed by the Kidds (1970). The other manufacturing types are classified using a similar coding system and attribute hierarchy, with the classes and types being defined on the basis of archaeological specimens and several 19th century bead sample cards and books. Although every attempt has been made to make the typology as comprehensive as possible, it is inevitable that new categories will be encountered as more bead assemblages are analysed. Should you record a new class or type, please inform me so that it can be added to the inventory. Although instructions for defining varieties are presented for each manufacturing type, no varieties are listed because they are far too numerous. Furthermore, the practicability of recording varieties in a comprehensive classification system becomes doubtful when one considers that well over 100,000 varieties of glass beads have been produced in the world to date (Liu 1975b: 31).

Glass Bead Classification

The primary criterion for sorting glass beads into typological categories is the technique of manufacture. Six major types are pertinent to North American researchers: drawn, wound, wound on drawn, mould pressed, blown and Prosser moulded.

DRAWN BEADS

Also called tube, cane and hollow-cane beads, the appellation "drawn" is preferred because it refers to the production process rather than the form of the finished product. As the process has been described in detail by Kidd and Kidd (1970: 48-49), only a brief survey will be presented here.

In the manufacture of drawn beads, a tube up to 300 yd long was drawn out from a hollow globe of molten glass by two men (Carroll 1917: 7). Depending on what stylistic variation was required, the globe may have been (1) composed of several differently coloured layers, (2) adorned with rods or lumps of coloured glass to form stripes, (3) marvered to create a specific shape, and/or (4) twisted during the drawing process to impart a spiral effect. Starting in the early 20th century, monochrome tubes were also produced using a process wherein moulten glass flowing over an iron mandrel was mechanically drawn out into a long tube. If the mandrel (which formed the perforation) was polyhedral, the perforation of the resultant tube would be the same shape. This is the only characteristic that distinguishes "mandrel-drawn" beads from those made using the older method.

When the tubes produced by either method were sufficiently cool, they were broken into manageable sections which were then sorted according to their diameter. These were subsequently cut into bead lengths by placing them on a sharp iron in the shape of a broad chisel and striking them with a blunt-edged, nearly triangular plate of steel (Anonymous 1825: 120; 1835: 79).

The resultant beads were either left unaltered, except for the possible grinding of facets, or their broken ends were rounded. Before 1817, the latter was accomplished by putting the beads in a large pan with sand and wood ash, or plaster and graphite. The pan was then heated over a charcoal fire and the contents stirred continually with a spatula resembling a hatchet with a round end (Anonymous 1825: 120). Another, much more efficient method came into use in Venice in 1817 (Francis 1979b: 10). It consisted of intermixing the rough beads with plaster and graphite or clay and charcoal dust, and then placing the mixture in an iron drum which was heated and rotated in an oven, a technique commonly referred to as "tumbling" (Orchard 1929: 85). In both processes the heat and agitation rounded the broken ends while the various "packing" mixtures kept the beads from sticking together and

prevented their perforations from collapsing as the glass became viscid. Depending on the length of time the beads were treated in this manner, they might range from practically unaltered tube fragments to almost perfect spheroids. After being allowed to cool, the beads were polished and sorted according to size by passing them through a series of graduated sieves.

Drawn beads have certain characteristics due to their method of manufacture. Beads may consist of unaltered tube sections with uneven broken ends, commonly referred to as "bugle" beads. Bubbles in the glass and striations on the surface, if present, are oriented parallel to the axis, an imaginary line passing through the centre of the perforation. The perforation is parallel-sided and usually has a smooth surface.

In the Kidds' system, drawn beads are divided into four classes according to their structure (simple or compound) and manufacturing sub-type (tubular or non-tubular). Each class is segregated into types on the basis of the general form of the beads and their decorative elements. Varieties are based on bead shape and the number, colour and diaphaneity of the structural elements.

The various classes and types recorded to date are listed below and illustrated in Figure 1a-d. Types marked with an asterisk (*) were encountered after the Kidds' classification system was published. The varieties are too diversified to be listed; see Kidd and Kidd (1970: 67-83) for these.

Class I

Tubular beads with simple (monochrome) bodies which may exhibit adventitious surface decoration. Cross-sections are round unless otherwise noted.

Ia Undecorated

Ib Decorated with straight, simple stripes

Ib' Decorated with spiral, simple stripes

Ibb Decorated with straight, compound stripes

Ibb' Decorated with spiral, compound stripes

Ic Beads with straight, polyhedral bodies

Ic' Beads with twisted, polyhedral bodies

Id Beads with straight, polyhedral bodies decorated with straight, simple stripes

Id' Beads with twisted polyhedral bodies decorated with spiral, simple stripes

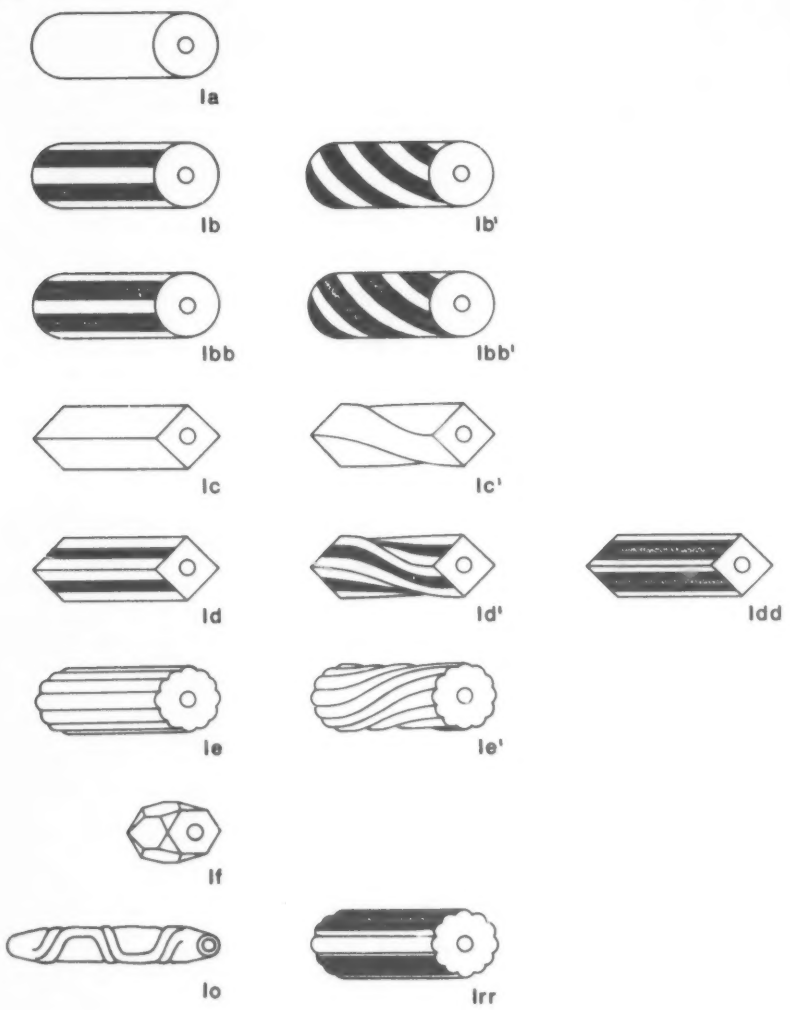

Figure 1a. Recorded types of class I drawn beads. (Drawing by D. Kappler)

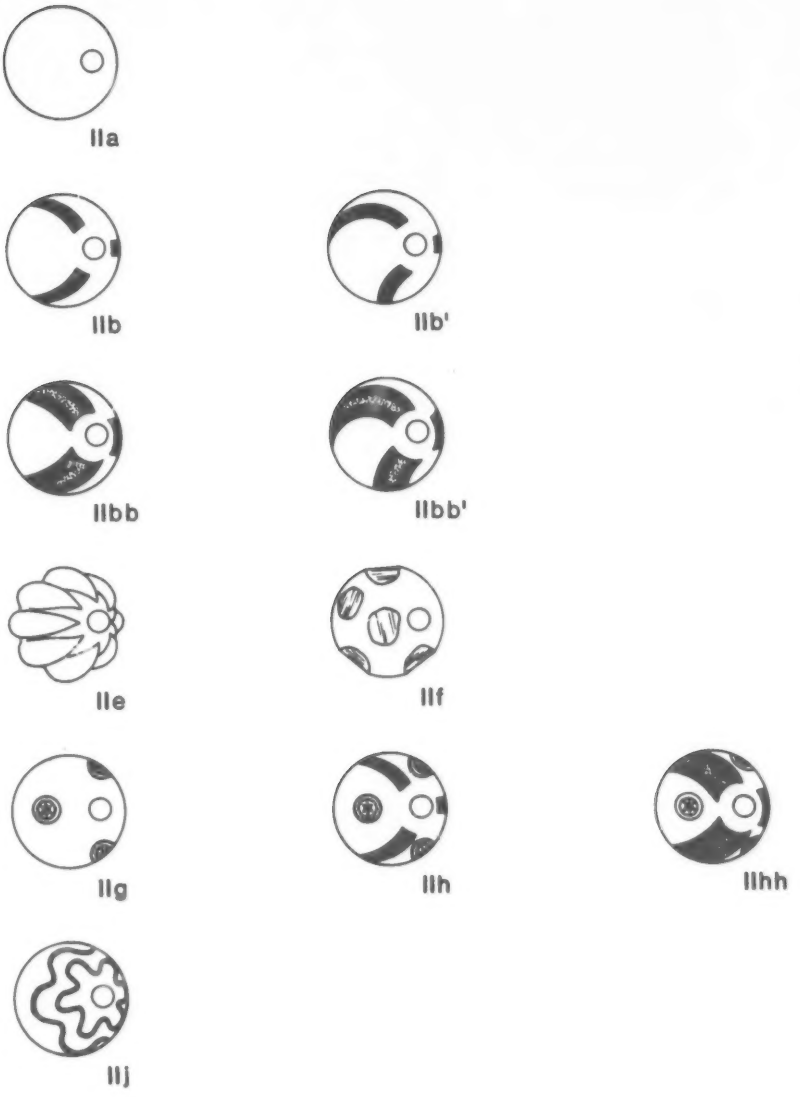

Figure 1b. Recorded types of class II drawn beads.
(Drawing by D. Kappler)

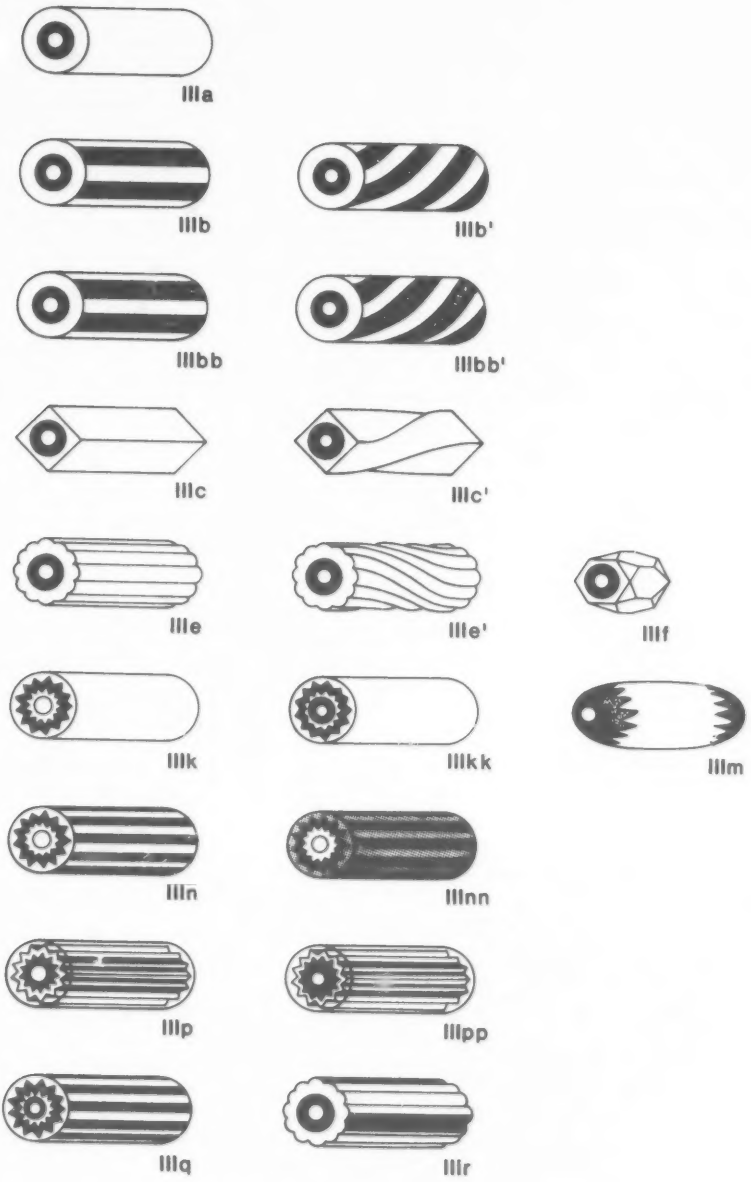

Figure 1c. Recorded types of class III drawn beads. (Drawing by D. Kappler)

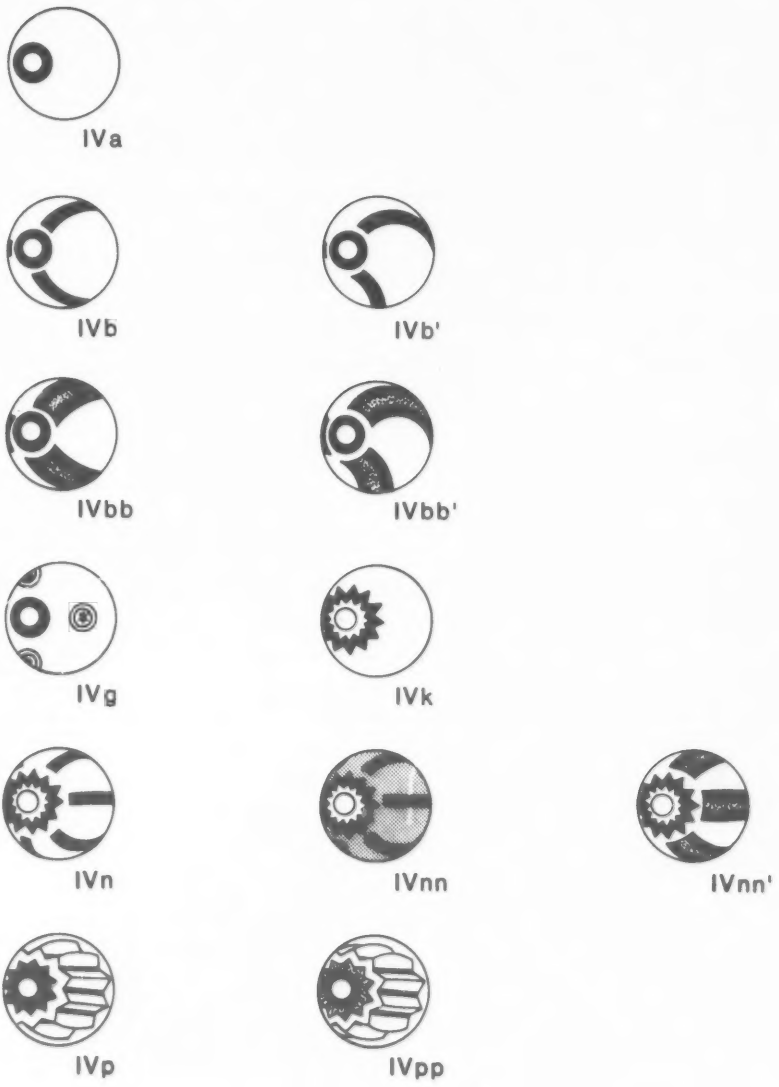

Figure 1d. Recorded types of class IV drawn beads. (Drawing by D. Kappler)

***Idd** Beads with straight, polyhedral bodies decorated with straight, compound stripes

Ie Beads with straight, ribbed or ridged bodies

Ie' Beads with twisted, ribbed or ridged bodies

If Beads whose surfaces have been modified by grinding

***Io** Hexagonal beads exhibiting an "alternating twist" pattern apparently produced by alternatingly twisting a heated hexagonal tube one way and then the other until a series of undulations have been formed in the body facets

***Irr** Beads with straight, ribbed or ridged bodies decorated with straight, compound stripes

Class II

Non-tubular beads with simple (monochrome) bodies which may exhibit adventitious surface decoration.

IIa Undecorated

IIb Decorated with straight, simple stripes

IIb' Decorated with spiral, simple stripes

IIbb Decorated with straight, compound stripes

IIbb' Decorated with spiral, compound stripes

IIe "Melon" beads (ridged bodies)

***IIf** Beads whose surfaces have been modified by the application of ground facets

IIg "Flush eye" beads (decorated with insets)

IIh Decorated with insets and straight, simple stripes

***IIhh** Decorated with insets and straight, compound stripes

IIj Beads encircled by two or more wavy lines

Class III

Tubular beads with compound (multi-layered) bodies which may exhibit adventitious surface decoration. Cross-sections are round unless otherwise noted.

IIIa Undecorated

IIIb Decorated with straight, simple stripes

***IIIb'** Decorated with spiral, simple stripes

IIIbb Decorated with straight, compound stripes

***IIIbb'** Decorated with spiral, compound stripes

IIIc Beads with straight, polyhedral bodies

IIIc' Beads with twisted, polyhedral bodies

IIIe Beads with straight, ribbed or ridged bodies

IIIe' Beads with twisted, ribbed or ridged bodies

IIIf Beads whose surfaces have been modified by grinding

IIIk "Chevron" beads with plain outer layers

***IIIkk** "Semi-chevron" beads (all layers except the core are "starry") with plain outer layers

IIIm "Chevron" beads made by grinding large, multi-layered tubes into round or oval forms to show the ridges of the second layer and the end design of the various layers.

IIIn "Chevron" beads decorated with straight, simple stripes on the outer layer

***IIInn** "Chevron" beads decorated with straight, simple stripes on the outer layer. These beads resemble porcelain imitations of type IIIn beads and are the tubular counterparts of type IVnn beads

***IIIp** "Chevron" beads decorated with straight, simple stripes on the surface of the second layer

***IIIpp** "Semi-chevron" beads (all layers except the core are "starry") decorated with straight, simple stripes on the surface of the second layer

***IIIq** "Semi-chevron" beads (all layers except the core are "starry") decorated with straight, simple stripes on the outer layer

***IIIr** Beads with straight, ribbed or ridged bodies decorated with straight, simple stripes

Class IV

Non-tubular beads with compound (multi-layered) bodies which may exhibit adventitious surface decoration.

IVa	Undecorated
IVb	Decorated with straight, simple stripes
IVb'	Decorated with spiral, simple stripes
IVbb	Decorated with straight, compound stripes
IVbb'	Decorated with spiral, compound stripes
IVg	"Flush eye" beads (decorated with insets)
IVk	"Chevron" beads with plain outer layers
IVn	"Chevron" beads decorated with straight, simple stripes on the outer layer
IVnn	"Chevron" beads decorated with straight, simple stripes on the outer layer. These beads resemble porcelain imitations of type IVn beads
***IVnn'**	"Chevron" beads decorated with straight, compound stripes on the outer layer
***IVp**	"Chevron" beads decorated with straight, simple stripes on the surface of the second layer
***IVpp**	"Semi-chevron" beads (all layers except the core are "starry") decorated with straight, simple stripes on the surface of the second layer

WOUND BEADS

Wound beads, also termed wire wound and mandrel wound, were produced by winding a viscid rod or a strand drawn therefrom around a rotating metal mandrel one or more times until the desired size and shape were achieved. While still soft, the beads might be decorated with any of a myriad of inlays or appliqués. They might also be pressed with small metal paddles or clamped in tong-like moulds to impart a design or a uniform shape (the latter should not be confused with the "mould-pressed" process [cf.]). When cool, the beads were stripped from the mandrel which is sometimes tapered or covered with chalk, graphite or clay to facilitate this step (Kidd and Kidd 1970: 49; Sprague 1979: 8).

The surfaces of wound beads usually exhibit swirl marks that encircle the axis. Bubbles are either round, or elongate and oriented like the swirl marks. The perforation may taper slightly and have an uneven surface.

The Kidds segregate wound beads into three classes according to their structure (simple or compound) and the relative complexity of their shape. Types are determined according to the shape and general configuration of the decoration, if any, whereas varieties are based on the colour and diaphaneity of the structural elements.

A listing of the various classes and types recorded to date follows (Fig. 2). Types marked with an asterisk (*) were encountered after the Kidds' classification system was printed. The diversity of the varieties precludes their being listed; see Kidd and Kidd (1970: 86-86) for these.

Class WI

Simple (single-layered), monochrome and polychrome beads with simple shapes.

WIa Cylindrical

WIb Round

WIc Oval

WId Doughnut-shaped

***WIe** Conical

***WIf** "Raised spiral" (shaped like a compressed cylindrical spring, this type consists of a glass rod wound in a spiral fashion)

Class WII

Simple (single-layered), monochrome and polychrome beads with relatively elaborate shapes formed by pressing, pinching, moulding, grinding or some other form of manipulation.

WIIa "Corn" beads (tabular beads in the shape of corn kernels)

WIIb Flat "disc" beads (tabular beads with circular outlines)

WIIc Faceted "five sided" beads (each bead has eight or ten, pentagonal, pressed facets)

WIId "Raspberry" beads (these exhibit several rows of prominent nodes)

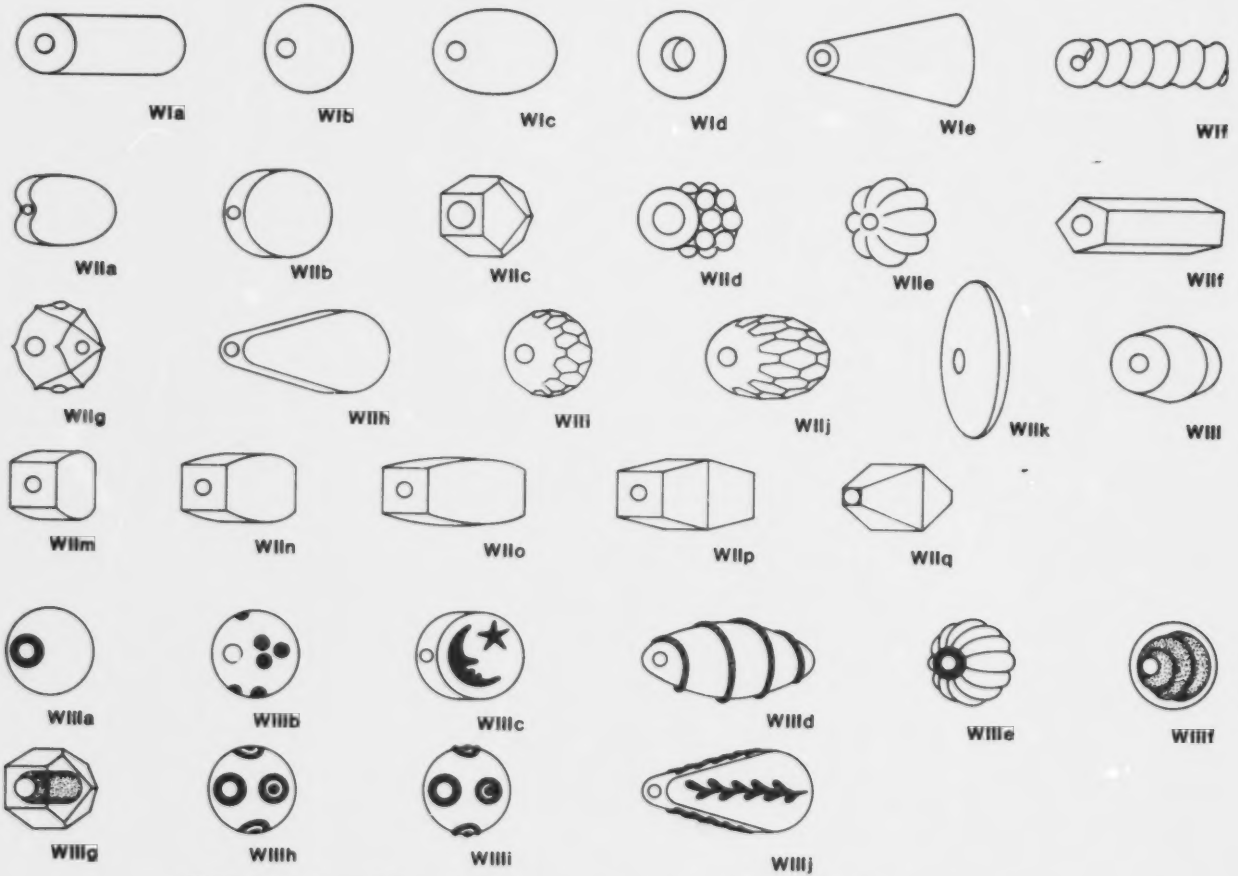

Figure 2. Recorded types of wound beads. (Note: Class WIII beads may exhibit shapes and design elements other than those shown.) (Drawing by D. Kappler)

WIIe "Melon" beads (lobed beads resembling melons)

WIIf "Ridged tube" beads (tubular beads with rectangular pressed facets that extend their entire length)

WIIg Beads with complex pressed designs

***WIIh** Flattened "teardrop" beads (teardrop-shaped beads pressed flat)

***WIIi** Round-faceted beads (round beads whose surfaces have been modified into facets by grinding)

***WIIj** Ovate-faceted beads (oval beads whose surfaces have been modified into facets by grinding)

***WIIk** Circular convex bicone beads (Beck's [1928] type I.A.1.e. – I.B.1.e.)

***WIIl** Standard circular truncated convex bicone beads (type I.C.1.f.)

***WIIm** Short square barrel beads (type IX.B.1.b.)

***WIIn** Standard square barrel beads (type IX.C.1.b.)

***WIIo** Long square barrel beads (type IX.D.1.b.)

***WIIp** Long square truncated convex bicone beads (type IX.D.1.f.)

***WIIq** Standard square bicone beads (type IX.C.2.e.)

Class WIII

Compound (multi-layered) beads with or without adventitious decoration, and simple (single-layered), monochrome and polychrome beads with adventitious decoration.

WIIIa Class WI beads with a surface coating of a different colour or material

WIIIb Class WI beads with inlaid decoration (incorrectly described in Kidd and Kidd 1970: 86)

WIIIc Class WII beads with inlaid decoration

WIIId Class WI beads with overlaid decoration

WIIIe Class WII beads with a surface coating of a different

colour or material (incorrectly described in Kidd and Kidd 1970: 86)

***WIIIf** Class WI beads with internal decorative elements

***WIIIg** Class WII beads with internal decorative elements

***WIIIh** Type WIIIa (multi-layered) beads with inlaid decoration

***WIIIi** Type WIIIa (multi-layered) beads with overlaid decoration

***WIIIj** Class WII beads with overlaid decoration

WOUND-ON-DRAWN BEADS

This is a rare type recorded only at one site in the Pacific Northwest (Sprague 1979: 9). It consists of a short section of drawn tubing about which has been wound a layer of contrastingly coloured glass. Having a red exterior and white core, the only variety observed to date is practically indistinguishable from its more common, all-wound counterpart. The only difference is that the cores of the former contain linear bubbles that parallel the axis.

As only one variety has been observed, it is impossible to do more than make a few suggestions concerning a classifactory scheme for wound-on-drawn beads. Using the wound-bead system as a basis, it is proposed that the wound-on-drawn category (designated WD) be divided into two structural classes:

Class WDI. Compound (undecorated, multi-layered)
Class WDII. Composite (decorated, multi-layered)

Types within each class would be designated according to the shape of the beads, and the general configuration of the decoration, if any. Varieties would be based on the colour and diaphaneity of the structural components.

MOULD-PRESSED BEADS

Variously cited in the literature as moulded, pressed, mandrel pressed, and mould pressed, the latter designation is adopted here as it seems to best describe the process of manufacture. Two basic methods were employed to produce the mould-pressed beads found on Canadian sites. In the first, the end of a glass rod was heated over an oil flame until it melted. A piece was then pinched from it and pressed in a tong-like two-piece mould. As the glass was compressed, any excess was forced out at the seam while a moveable pin pierced the glass and formed the perforation.

In the second method, two pieces of viscid glass, one in either half of a two-piece mould, were pressed together to fuse them. This permitted the production of beads with complex coloured patterns that would have been distorted or destroyed in the previous process. The movable pin that formed the perforation usually extended from one half of the mould to the other in the case of round and oblate beads and across the open face of the mould for flattened and elongated specimens. Consequently, the beads in the former group have seams about their equators, whereas those in the latter have seams along their sides and ends.

After the beads were removed from their respective moulds, their mould seams, as well as any facets that might have been present, were frequently ground smooth. If the perforation remained sealed off at one end as in the case of the "mandrel pressed" beads described by Ross (1976: 739), it was punched through.

Mould-pressed beads are usually symmetrical though they may display tiny flattened areas. They may also have pebbled ("orange peel") surfaces, or exhibit mould marks in the form of slight to bold ridges and linear bulges, seams in coloured patterns, or slightly differently coloured linear zones caused by differential light refraction. The perforations sometimes taper distinctly and frequently have crackled surfaces.

Although the manufacturing sub-type might seem to be the ideal criterion for identifying classes within the mould-pressed category, the difficulty in distinguishing the two, unless there are coloured patterns in the glass, precludes this. Instead, the category (designated MP) is divided into four classes based on structure (monochrome and polychrome) and the presence or absence of surface decoration and faceting. Shape determines the type, whereas varieties are defined according to the colour and diaphaneity of the structural elements, the configuration of the decoration, and the number, shape and type (mould imparted or cut) of facets.

The classes and types recorded to date are listed below and illustrated in Figure 3.

Class MPI

Plain monochrome beads.

MPIa Round

MPIb Oval

Class MPII

Monochrome beads exhibiting faceting and/or surface decoration.

MPIIa Round-faceted

MPIIb Long hexagonal barrel (Beck's [1928] type XIII.D.1.b.)

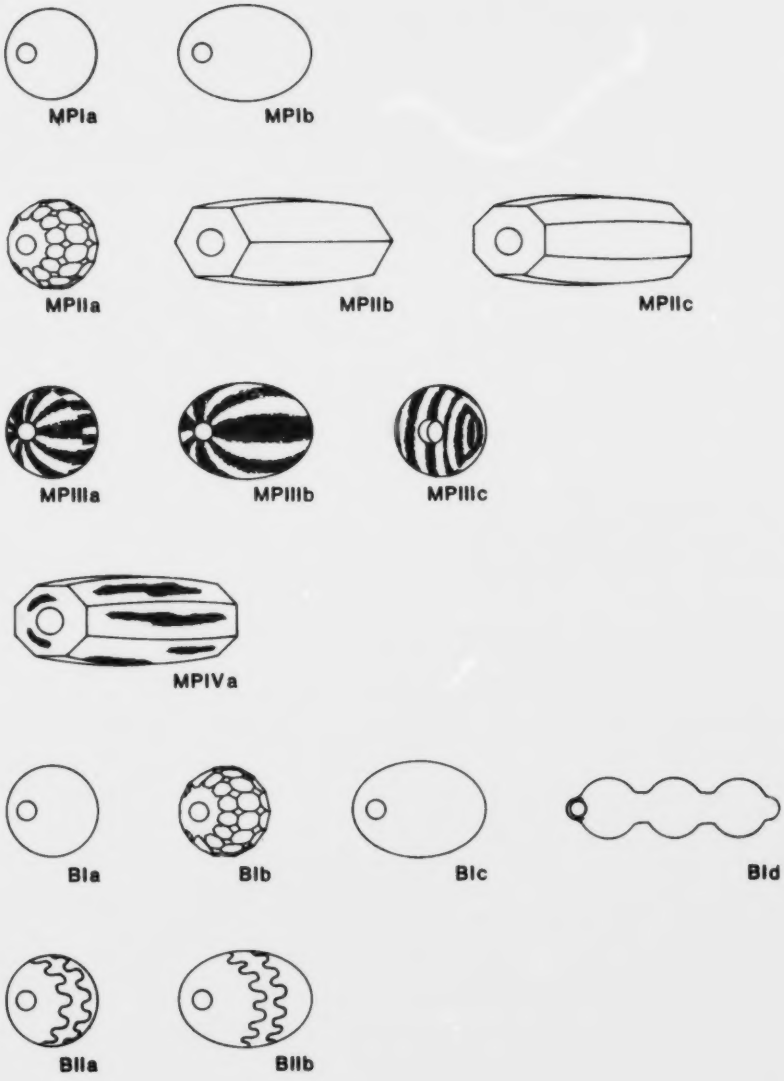

Figure 3. Recorded types of mould-pressed and blown beads. (Drawing by D. Kappler)

MPIIc Long octagonal barrel (Beck's type XIV.D.1.b.)

Class MPIII

Plain polychrome beads.

MPIIIa Round

MPIIIb Oval

MPIIIc Doughnut-shaped

Class MPIV

Polychrome beads exhibiting faceting and/or surface decoration.

MPIVa Long octagonal barrel (Beck's type XIV.D.1.b.)

BLOWN BEADS

Three methods have been noted for the manufacture of blown beads. The first entailed fixing a small gather of molten glass on the end of a blowpipe and blowing it into a bubble with a slight hollow projection at either end. When the bubble had cooled, the projections were broken off, creating the perforation, and the jagged edges were usually fire-polished. The second method is essentially the same except that the bubble was blown in a two-piece mould, to impart either a design or a special or uniform shape. In the third method, a series of bubbles was blown in a heated glass tube. The latter was then broken into individual or segmented beads whose ends may or may not have been firepolished.

The beads produced by any of the aforementioned methods could be coloured by painting their surfaces or introducing paint, coloured wax, powdered fish scales or metal dust into their interiors (Pazaurek 1911: 2). They were often filled with white wax to render them less fragile (Lardner 1972: 236).

Although the ideal criterion for the primary sorting of blown beads would be the manufacturing sub-type, the difficulty in determining the latter in archaeological specimens makes its use impractical. Rather, the category (designated B) is segregated into two classes based on the presence or absence of decorative elements. Types are distinguished according to shape, with the manufacturing sub-type being indicated if determinable. Varieties are defined by the colour and diaphaneity of the structural elements; the nature of the colouration (external, internal, or in the glass itself); and where applicable, the number, shape and type (mould imparted or cut) of facets; the configuration of the decoration; and the number of segments.

The known classes and types of blown beads are listed below and illustrated in Figure 3.

Class BI

Simple (undecorated) beads.

BIa Round

BIb Round-faceted

BIc Oval

BId Segmented

Class BII

Complex (decorated) beads.

BIIa Round

BIIb Oval

PROSSER MOULDED BEADS

This manufacturing type was defined by Sprague (1973; 1983) and Ross (1974: 18) who termed it "Prosser molded" because of its similarity to the moulding technique for ceramic buttons that was patented by Richard Prosser in 1840. Although Ross (1974: 22; 1976: 767-70) hypothesizes that the beads were made of molten glass in essentially the same manner as mould-pressed beads, a present-day producer – the Jablonex Foreign Trade Corporation in Jablonec nad Nisou, Czechoslovakia – informs us (1977, pers. com.) that "tile beads" (as they are generically called in the manufacturer's parlance) are "made of glass powder which is moulded and melted." As they would not elucidate, the technological aspects remain a mystery.

Two types of Prosser moulded beads have been recorded to date. One is spherical with a broad, raised band about the equator; the other is in the form of a short cylinder. On both, one end is rounded and smooth, while the other is flat and rough or pebbled. The perforation tapers toward the rounded end. Exterior surfaces range from glazed to dull, the latter resembling unglazed porcelain.

As the data base is so limited, it is presently impossible to formulate a classificatory scheme for Prosser moulded beads (designated PM).

Glass Bead Attributes

The following attributes are listed in descending order of their relative importance in the classification of glass beads.

STRUCTURE

Structure refers to the physical composition of a bead. There are four structural categories (Stone 1974: 88-89):

Simple — beads composed of a single, undecorated layer of glass.
Compound — beads composed of two or more, undecorated layers of glass.
Complex — simple specimens with adventitious decoration.
Composite — compound specimens with adventitious decoration.

SHAPE

Although the shape nomenclature utilized by the Kidds is basically self-explanatory, a few comments will help elucidate some of the terms.

All **tubular** beads are assumed to have round cross-sections unless otherwise noted. As they often grade imperceptibly into the circular group, tubular specimens may be segregated using the following criteria. A bead of any length is classified as tubular if it has broken or cut ends that have not been altered by "tumbling." If the ends have been rounded, a bead is tubular if its length exceeds its diameter.

Circular specimens, shaped like little rings, have diameters equal to or greater than their lengths.

The **round** category includes beads not only spheroidal, but also oblate and barrel-shaped. The latter should be designated round (oblate) and round (barrel-shaped), respectively.

Some **oval** beads are also barrel-shaped and should be recorded as oval (barrel-shaped).

The term **doughnut-shaped** refers to those beads in the wound category that have extremely oblate bodies and very large perforations (the configuration is much like that of a Life Saver candy). Similarly shaped beads in the drawn category would be termed "circular."

The Kidds use the term **flat** to define those drawn beads that have been pressed flat parallel to the perforation while the glass was still viscid. As this does not reveal anything about the bead's pre-flattened shape, it is recommended that the term be modified to include this information. For example, a flattened round bead would be recorded as "flat-round."

Other shapes are defined in the Glass Bead Classification chapter

of this guide. Should new shapes be encountered, the use of Beck's (1928) system and terminology to designate them is recommended. The hierarchical charts for "regular-rounded" and "regular-faceted" beads are presented in Figures 4 and 5. For beads with specialized and irregular shapes see Beck (1928). However, as multi-faceted specimens are not adequately covered in the latter, a few comments may be appropriate.

Tubular beads of types If and IIIf that have hexagonal- and heptagonal-sectioned bodies whose corners have been removed by grinding are termed **tubular, cornerless hexagonal** and **tubular, cornerless heptagonal,** respectively. These are the so-called "Russian" beads.

As for beads with more than 21 facets, if the exact shape cannot be determined using Beck, it is suggested that the general form of the bead be given followed by the qualifier "faceted" (for example, round-faceted or elongate-faceted). To this should be appended a description of the type (cut or mould imparted), shape, number and location of the various facets.

DECORATION

The adornment encountered on North American beads falls into three major categories:

Overlaid – appliqués of glass or another material that either rest on or protrude noticeably from the surface of the bead (this includes painted decoration).

Inlaid – embedded elements whose surfaces are either flush with or only slightly above the surface of the bead.

Internal – decorative elements, such as coloured cylinders, spiral bands and metal foil, located within the body of the bead.

Beads may be decorated using multifarious techniques and decorative elements, the most common of which are the following:

Stripes – the most common design element on drawn beads, stripes may be simple (monochrome) or compound (polychrome), and straight or spiral (Fig. 6a-b).

Wavy lines – undulating lines that may be either simple or compound (Fig. 6c-d).

Interwoven lines – also called "double wave," this design consists of two crossed wavy lines (Fig. 6e).

Rings – stripes in the form of circles that extend about a bead perpendicular to the perforation; beads decorated with rings are termed "zone" or "zoned" beads (Fig. 6f).

Combed designs – rings or spiral stripes applied to the surface of a bead are heated until viscid and then have a wire drawn through them to produce a series of scallops, ogees, zigzags or feather-like patterns (Fig. 6g-j).

Eyes – specimens adorned with simple or compound dots are called "eye beads" (Fig. 6k-m).

Floral designs – included in this group are various designs in the form of simple or compound wreaths, flowers, biossoms and plants whose

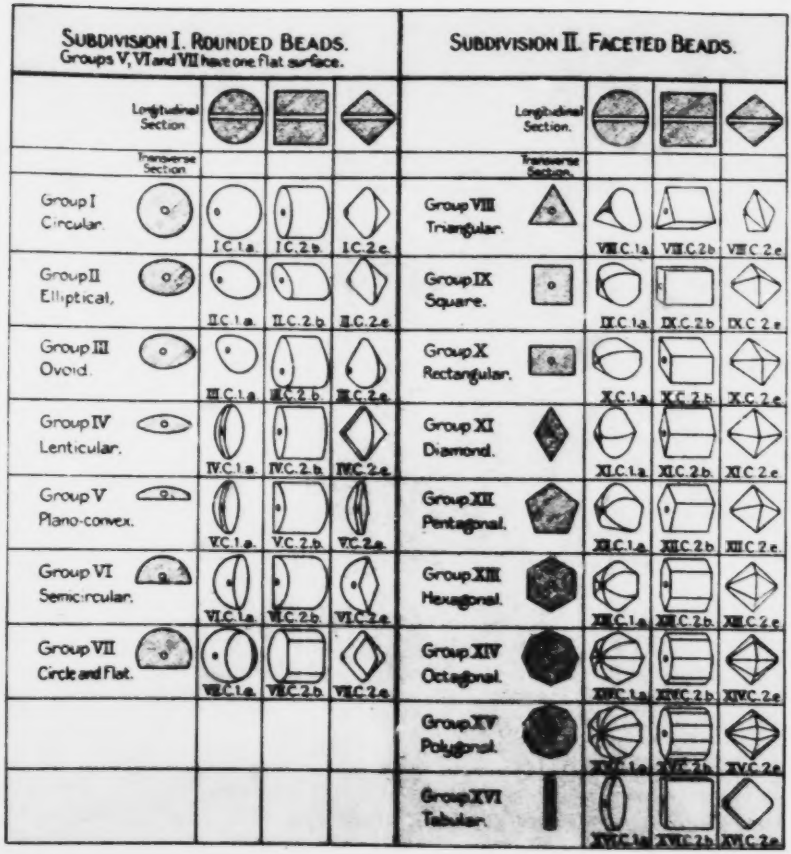

Figure 4. Groups of regular-rounded and regular-faceted beads (Beck 1928: Plate 1).

appearance ranges from highly stylized to realistic (Fig. 6n-o).

Crumbs — "crumb beads" are made by embedding small pieces of contrastingly coloured glass in the plastic body of a bead; the crumbs may protrude from the surface or be flush with it (Fig. 6p-q).

Swirls — two or more coloured glasses may be swirled together to ornament the surface of a bead or to form the body thereof (Fig. 6r).

Other forms of decoration that may be encountered are described and illustrated in Beck (1928), van der Sleen (1967) and Francis (1979a).

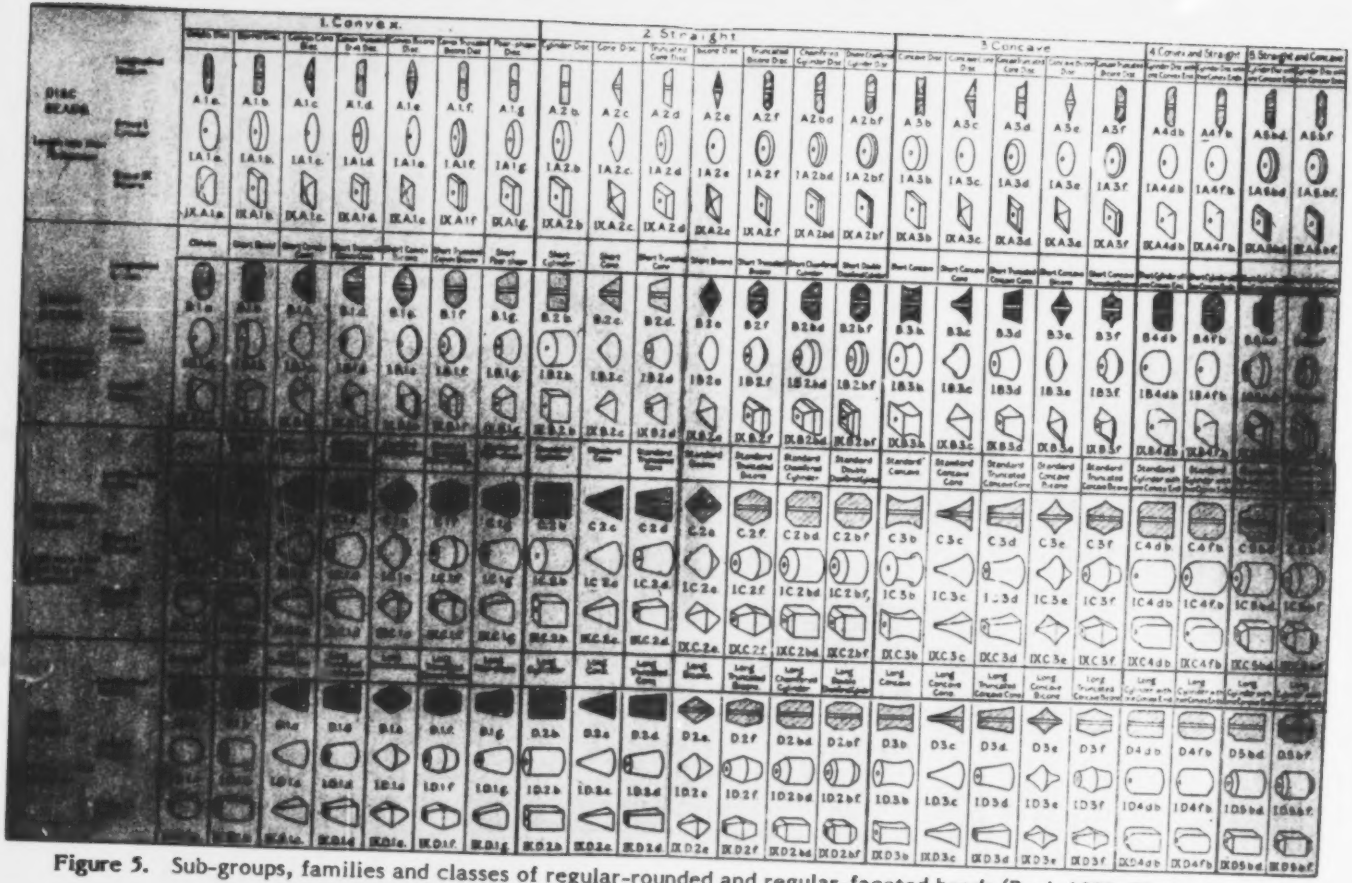

Figure 5. Sub-groups, families and classes of regular-rounded and regular-faceted beads (Beck 1928: Plates 2 and 3).

Figure 6. Some common forms of decoration: a-b, stripes; c-d, wavy lines; e, interwoven lines; f, rings; g-j, combed designs; k-m, eyes; n-o, floral designs; p-q, crumbs; r, swirls (Beck 1928; van der Sleen 1967).

COLOUR

In the Kidds' system, colours are designated using the names and codes proposed in the *Color Harmony Manual* (Container Corporation of America 1958). However, as the latter is rather obscure and may not be available to other researchers, the equivalent codes in the better known Munsell colour notation system should also be provided. The relevant Color Harmony colours and their Munsell equivalents are listed in Table 1. The latter also presents the Bustanoby (1947: 28) colour system colours used by Harris and Harris (1967) and Sudbury (1976) in their useful chronologies.

Table 1. Munsell/Color Harmony/Bustanoby Colour System equivalents.
*Colours recorded by the Kidds.

Munsell Code	Color Harmony Code	Color Harmony Name	Bustanoby name and Code
10.0Y 8.5/10	1 la	Lemon Yellow*	
10.0Y 7/5	1 gc	Citron*	Chartreuse (C3)
10.0Y 5/6	1 le	Olive Yellow	
10.0Y 4/4	1 ni	Olive	
7.5Y 7/7	1-1/2 ic	Light Antique Gold	Brass (A9)
7.5Y 7/5	1-1/2 gc	Dusty Yellow	Colonial Yellow (A7)
5.0Y 9/2	2 ba	Pearl	
5.0Y 8.5/8	1-1/2 ga	Sunlight Yellow	
5.0Y 8/12	1-1/2 ne	Dandelion	Dandelion (B6)
5.0Y 8/10	1-1/2 ia	Daffodil	Sunflower (A3)
5.0Y 6/4	2 lg	Mustard Tan*	
2.5Y 9/3	2 ca	Light Ivory*	Caen Stone (G2)
2.5Y 7/8	2 ic	Light Gold*	Honey (A8)
2.5Y 6/8	2 ne	Mustard Gold	
2.5Y 4/6	2 pi	Mustard Brown	
2.5Y 2/2	2 pn	Dark Brown*	
10.0YR 7/12	3 la	Marigold	Pumpkin (D11)
10.0YR 7/8	3 ic	Amber*	
10.0YR 5/6	3 ie	Cinnamon*	
10.0YR 4/1	3 ih	Lead Gray	
7.5YR 4/4	4 ng	Maple*	
5.0YR 6/12	4 nc	Russet Orange	Tomato (F12)
5.0YR 5/1	5 lr	Ashes	
2.5YR 5/10	5 lc	Copper	
2.5YR 6/10	5 pe	Terra Cotta	
2.5YR 2/2	7 pn	Dark Rose Brown*	
10.0R 5/10	6 ic	Coral*	Pimento (H11)
10.0R 4/8	6 ne	Redwood*	Harvard Crimson (H12)
10.0R 3/8	6 pg	Barn Red	
10.0R 3/2	6 ni	Taupe Brown	
10.0R 2/4	6-1/2 pi	Deep Red Brown	
7.5R 4/14	7 pa	Scarlet*	
7.5R 3/8	6-1/2 ne	Brick Red	
5.0R 8/4	7 ca	Baby Pink	Baby Pink (D4)
5.0R 7/8	7 ga	Light Cherry Rose*	
5.0R 5/12	7-1/2 la	Light Red	
5.0R 3/6	7 ng	Old Wine	
2.5R 3/10	8 pc	Ruby*	
10.0RP 8/4	8 ca	Pale Pink	Peachblossom (H4)
10.0RP 4/6	8 le	Rose Wine*	
2.5RP 7/4	9 ec	Orchid Mist	Wild Rose (H5)
10.0P 4/6	10 ie	Heather	Magenta (H6)
7.5P 4/8	11 lc	Amethyst*	Heliotrope (D3)
5.0P 5/4	11 ge	Lilac	
7.5PB 4/11	13 la	Bright Dutch Blue*	
7.5PB 2/10	12-1/2 pc	Royal Blue	
7.5PB 2/7	13 pg	Bright Navy*	Independence Blue (H9)
7.5PB 2/5	12-1/2 ng	Dark Blue	Wedgewood Blue Dark (A12)
6.25PB 3/12	13 pa	Ultramarine*	
5.0PB 5/7	13-1/2 ic	Copen Blue	Cornflower Blue (A11)
5.0PB 4/4	13-1/2 lg	Medium Shadow Blue	Grape (F9)
5.0PB 3/6	13-1/2 ng	Medium Blue	Delft & Yale Blue (B8,H8)

Table I. (Continued)

Munsell	Code	Color Harmony Code	Color Harmony Name	Bustanoby name and Code
2.5PB	6/9	14 ia	Bright Copen Blue*	
2.5PB	5/6	14 ie	Shadow Blue*	Sky Blue (H7)
2.5PB	4/6	14 ie	Medium Blue	Copenhagen Blue (F8)
2.5PB	3/8	14 pc	Deep Blue	
10.0B	6/3	15 ge	Mist Blue	Brittany Blue (F7)
10.0B	2/4	14 pi	Dark Navy*	
7.5B	8/2	15 ca	Pale Blue*	
7.5B	6/6	15 ic	Sky Blue	
7.5B	6/2	16 ge	Light Gray Blue	
7.5B	4/8	15 nc	Cerulean Blue*	Bluebird (B7)
7.5B	8/4	16 lg	Medium Shadow Blue	
7.5B	3/3	15 ni	Dark Shadow Blue*	
5.0B	8/4	16 ea	Light Aqua Blue*	
5.0B	6/6	16 ic	Robin's Egg Blue*	
5.0B	5/7	16 ic	Bright Blue*	
5.0B	4/6	16 ne	Peacock Blue	Peacock Blue (D9)
5.0B	4/5	16 ie	Pale Medium Blue	Gobelin Blue (C11)
5.0B	3/3	16 ni	Dark Gray Blue	Navy Blue (B9)
2.5B	7/2	17 ec	Dusty Aqua Blue	
2.5B	6/7	17 ia	Bright Aqua Blue	
2.5B	6/4	18 gc	Aqua Blue*	Turquoise (D8)
2.5B	5/5	17 ie	Med. Turquoise Blue	
10.0BG	4/8	17 pe	Turquoise*	
7.5BG	8/4	19 ea	Light Aqua Green	
7.5BG	6/8	18 ia	Bright Turquoise	
7.5BG	6/6	19 ic	Aqua Green	
7.5BG	6/3	19 ge	Dusty Aqua Green	
5.0BG	8/2	19 ba	Ice Blue	
5.0BG	6/3	20 gr	Light Blue Spruce	
5.0BG	4/8	20 nc	Turquoise Green	
5.0BG	3/6	20 ng	Teal Green*	
10.0G	6/6	21 ic	Light Jade Green	
10.0G	5/10	21 nc	Emerald Green*	
10.0G	4/5	21 ng	Dark Jade Green	Emerald Green (F3)
5.0G	5/6	22 ie	Surf Green*	
2.5G	9/2	22 ca	Pale Green	
2.5G	7/8	22 ia	Bright Mint Green*	
2.5G	5/10	22 nc	Bright Green	
2.5G	3/6	22 pi	Dark Green	
2.5G	2/3	22 pl	Bottle Green	Bottle Green (A6)
10.0GY	6/6	23 ic	Apple Green*	
10.0GY	5/10	23 pe	Grass Green	
10.0GY	4/6	23 ni	Dark Palm Green*	
10.0GY	3/5	23 pi	Dark Grass Green	Mint Green (C6)
7.5GY	8/2	24 cb	Celadon Tint	Surf Green (F1)
7.5GY	6/6	24 ie	Leaf Green	Jade Green (F2)
7.5GY	4/3	24 li	Sage Green	
5.0GY	5/6	24 ng	Leaf Green	Fern Green (C5)
2.5GY	4/4	24-1/2 ni	Olive Green	Olive Green (E5)
N	9/0	a	White*	
N	8/0	b	Oyster White*	Oyster White (E10)
N	7/0	c	Light Gray*	
N	1/0	p	Lamp Black*	

Although some researchers have used the coloured plates in Kidd and Kidd (1970) to identify the colours of their specimens, this practice is not endorsed. For one thing, the colour rendition in the plates, especially that in the French edition, is not true enough to permit proper identification. For another, the list of recorded colours (Table 1) has practically quadrupled since 1970 so that the plates provide far from adequate coverage. The proper procedure is to compare the beads, fixed on the tip of a teasing needle, to the glossy finish chips in the *Color Harmony Manual* or the *Munsell Book of Color* (Munsell Color 1976). Should the high cost of these references preclude their procurement, it may be possible to obtain them on Inter-library Loan, or the chips for all of the Munsell colours listed in Table 1 can be purchased from Munsell Color, 2441 No. Calvert St., Baltimore, Maryland, 21218, for about $240.00.

To properly determine the colour of a bead, it must first be cleaned of all dirt and patination. If the surface is eroded, dull or lightly patinated, the specimen should be wet to bring out the true colour. The comparison with the colour chips should be made against a neutral background in natural daylight or daylight-approximating fluorescent light. Incandescent lighting should be avoided as it imparts an orange hue to the glass. The colours of opaque beads must obviously be ascertained using reflected light. However, those of transparent and translucent specimens should be observed using transmitted light with the reflected colour being noted if it varies significantly (for example, transparent rose wine beads which appear black unless held up to a strong light). If the glass has a distinctive golden or opalescent cast such as often noted in pale blue specimens, this should also be recorded.

DIAPHANEITY

The diaphaneity of beads is described using the terms opaque (op.) translucent (tsl.) and transparent (tsp.). Although the Kidds use "clear" in lieu of "transparent," the latter term is preferred as it is more descriptive. Simply defined, beads that are **opaque** are impenetrable to light except on the thinnest edges. **Translucent** specimens transmit light, yet diffuse it so that objects viewed through them are indistinct; for example, a pin inserted in the perforation appears only as a shadow when viewed through the body of the bead. Objects viewed through **transparent** beads are clearly visible. As bubbles can effect the diaphaneity of a bead, their presence in large numbers should be noted.

LUSTRE

The appearance of the surface of a bead in reflected light is known as its lustre. The two most common kinds are shiny (smooth and bright) and dull (not shiny). Others that may be encountered are metallic

(having a metallic sheen), greasy (the appearance of an oiled surface) and satiny (characterized by a fibrous structure).

SIZE

Although the five arbitrary size categories (very small, under 2 mm; small, 2-4 mm; medium, 4-6 mm; large, 6-10 mm; and very large, over 10 mm) proffered by the Kidds are useful in relating relative size, research conducted by Ross (1976: 684-766) and Karklins (1979: 160-61) has revealed that they are too broad to be of any use in establishing historical size groups where the inter-size interval can be as little as 0.2 mm. Measurements are to be made to the nearest tenth of a millimetre using vernier calipers. The pertinent dimensions for most beads are length (parallel to the perforation) and diameter (perpendicular to the perforation). However, in the case of flattened specimens, they are length (parallel to the perforation), width (perpendicular to the perforation) and thickness (perpendicular to the width). The size of the perforation has not been found to be significant. Where there is more than one specimen per variety, ranges, means and modes should be computed for the sample.

Historical Archaeological Interpretations

ORIGINS

Although Venice/Murano, Bohemia and The Netherlands produced the bulk of the glass beads that were exported to the New World, Germany, Austria, England, France and China also appear to have contributed their share (Kidd 1979; Liu 1975a). Unfortunately, there is no routine method to determine the country of origin for any given bead type. Although van der Sleen (1967: 108) has proposed that Dutch beads can be distinguished from those of Venetian origin on the basis of chemical composition (Dutch beads supposedly having a high potassium content compared with a high sodium content in Venetian specimens), this supposition seems to have been based on limited evidence and is not supported by more recent findings (Karklins 1983: 116). It also totally ignores the chemical make-up of beads manufactured in other countries which must also be high in either potassium or sodium, these being the two standard fluxes utilized in the production of glass.

The problem is further heightened by the notable scarcity of comparative material. Aside from the van der Sleen and van der Made collections of 17th-18th century Dutch beads in Amsterdam (Karklins 1974; van der Made 1978), there are no recorded assemblages of pre-19th century beads whose manufacture can be attributed with any certainty to a specific country. There is better coverage for the 19th and 20th centuries, but no one has as yet synthesized the data. Clearly much more research is necessary to resolve the question of origins.

CHRONOLOGY

As is the case with most classes of artifacts, no one has as yet worked out a comprehensive chronology for Canadian beads. Fortunately, there are several regional chronologies that will help archaeologists and analysts to date their problematical specimens. Although nothing has been formulated for the Yukon and Northwest Territories, researchers in the Atlantic provinces and Quebec may find some comparative material in James W. Bradley's (1983) summary of the beads of 16th-17th century New England. Ontario lacks a comprehensive chronology, but for those working on 17th century sites in the southeastern part of the province, the chronology prepared by Ian and Thomas Kenyon (1983) is a must. Other works relevant to Ontario and Quebec include Bennett (1983), Pratt (1961), Quimby (1966) and Wray (1973, 1983). Several of the volumes in Fenstermaker's *Archaeological Research Booklet* series may also be useful (Fenstermaker 1974a, b, 1977), as well as Kent (1983). These references deal with the period from 1550 to 1820. A sequence for post-1820 beads has yet to be devised.

Researchers in the Prairie provinces should consult Davis (1972), an abbreviated version of which appears in Davis (1973). The reports by Harris and Harris (1967) and Sudbury (1976) are also recommended. They cover 1700 to 1885.

As for the West Coast, Quimby (1978) presents an overview of the state of the knowledge of beads in the Northwest, and Woodward (1965, 1970) provides generalized dates for some of the more common bead types. For comparative purposes, Ross' (1976) treatise on Fort Vancouver (1829-60) is essential. More comparative information for this and the other regions may be found by checking the index in Karklins and Sprague (1980).

FUNCTION

Unless a bead is found in an archaeologically diagnostic context (for example, sewn to clothing, situated at the neck of a burial, or strung on a rosary), it is extremely difficult to assign it a specific function. Although "little" beads (those under about 6 mm in diameter) were commonly used in embroidery, they were frequently also employed in the formation of necklaces, earrings, nose and hair ornaments, mats and as decorative inlays in aboriginal pottery and other items. Similarly, "big" beads (those over about 6 mm in diameter) are commonly thought of as necklace components but also served to adorn fringes, baskets, mats, vases and other items. Thus to arrive at the real function of a bead, not only must its size be considered but also the archaeological and ethnohistorical evidence.

USE/WEAR MARKS

Beads occasionally exhibit use/wear marks that may be useful in establishing their function. Medium to very large specimens are sometimes abraded or battered on the ends, intimating use in necklaces. Abraded surfaces on the same size beads may indicate use in such domestic items as mats and table covers. Severe battering or abrasion may denote heirloom pieces utilized over a long period.

POPULAR AND HISTORICAL NAMES

Over the years, certain beads have acquired names that are used by dealers, collectors and, to some degree, archaeologists. Although some of them are vague or have lost their significance (for example, "pony" and "pound"), others such as "chevron" or "star," "Russian" and "Cornaline d'Aleppo" immediately bring to mind specific bead types. This being the case, popular or historical names should be recorded when known.

Appendix A. Instructions for Completing Parks Canada Artifact Data Base Input Forms for Glass Beads

The forms are to be filled out using the terminology set forth in the preceding guide and the field-specific instructions presented below. A completed sample form is appended.

Category
Enter PERSONAL/DOMESTIC.

Subcategory
Enter ORNAMENT.

Article
Enter BEAD.

Model
If known, enter the popular or historical name for the specimen.

Type
Enter the appropriate manufacturing category, class and type designation proffered in the preceding guide, and the Kidd and Kidd (1970) variety number if applicable. If there is no variety number, append an asterisk (*) to the code.

Date
If known, enter the temporal range as indicated by the archaeological context or a regional chronology. The latter should be referenced.

Material
Enter GLASS, and any non-glass elements that may be present as overlays, inlays or internal decoration.

Manufacture
Enter the appropriate technique of manufacture including the sub-type, if applicable. Record any marks resulting from manufacture.

Dimensions
Record the measurement as outlined under Size in the attached guide. Where large quantities of beads are involved, tally the measurements on the back of the form and enter the range, mean and mode(s) on the front.

Description
Record the following attributes:

Structure (simple, compound, complex, or composite).

Shape of body (e.g. tubular, circular or round).

Shape of perforation if other than cylindrical (e.g. square-sectioned, Y-shaped or tapered).

Colour and diaphaneity of body using the Color Harmony name and code or the Munsell code; also note the lustre.

Facets – list their number, shape and location, and how produced (cut, paddle pressed or mould imparted).

Miscellaneous attributes, such as bubbles, patination, striae or swirl marks on or in the glass.

Decoration
Enter the major decorative category (overlaid, inlaid or internal) followed by a detailed description of the various decorative elements including their quantity, colour and diaphaneity, physical appearance, location and orientation.

Condition
Enter COMPLETE or INCOMPLETE, and note if burned, crizzled, solarized, etc.

Comments
Enter use/wear or archaeological data that might help establish function.

Parks Canada / Parcs Canada — OBJECT CATALOGUE / CATALOGUE D'OBJET

2 | 0,0,8,Z,0,9,9,A,0,2,3,-,0,0,0,4

3 LOCATION ENDROIT: HEADQUARTERS

4 REFERENCE Nº / Nº DE RÉFÉRENCE:

5 GROUP GROUPE: GLASS

6 CATEGORY CATÉGORIE: PERSONAL / DOMESTIC

7 SUB CATEGORY SOUS CATÉGORIE: ORNAMENT

8 ARTICLE: BEAD

9 MODEL MODÈLE: CORNALINE D'ALEPPO

10 TYPE GENRE: WIII b *

11 PATENT Nº / Nº DE BREVET:

12 SERIAL Nº / Nº DE SÉRIE:

13 QUANT.: 2

14 ASCRIPTION ATTRIBUTION:

15 MAKER FABRICANT:

16 PERIOD FROM / PÉRIODE DU: TO / AU:

17 DATE: 1852 - 1886 (site date)

18 MATERIAL MATÉRIEL: GLASS

19 MANUFACTURE FABRICATION: WOUND

20 DIMENSIONS: L: 9.3 mm, 8.7 mm
D: 4.6 mm, 4.2 mm

21 DESCRIPTION: COMPOSITE; CYLINDRICAL BODY: tsp. scarlet (7 pa) outer layer, op. white (a) core; perforation tapers slightly; shiny surface; distinct wind marks in both layers of glass.

22 DECORATION DÉCORATION: Inlaid: a floral wreath of op. bright blue (16 lc) on op. white (a) about the middle, and a ring of op. light gold (2 ic) around either end.

23 MARKS MARQUES:

24 CONDITION ÉTAT: COMPLETE

25 CONSERVATION:

26 MENDS COLLAGES:

27 PHOTOS PHOTOGRAPHIES: RA-98 W

28 DRAWINGS DESSINS:

29 PUBLICATIONS:

30 COMMENTS OBSERVATIONS: Ends battered

31 CATALOGUER PRÉPOSÉ AU CATALOGUE: T.E. LAWRENCE

32 DATE: 2,5,0,3,8,0

PC 693 (7-78)

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